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Editorial Department.

A higher training and greater individual ability are essential today for Infantry than for any other arm. It is more difficult and it takes a longer time to train Infantry to any standard of efficiency today than to bring any other arm to a corresponding standard.

The Army Reorganization Act.

The military phase of preparedness legislation has at last reached its conclusion in the Army Reorganization Act of 1916, "To increase the efficiency of the Military Establishment of the United States." This enactment is unique in the history of our military legislation as the first law on our statute books which contemplated the organization of an army in time of peace. For the first time in our history, the principle is embodied in law that the peace composition of an army should be based on its war organization in order that it may be capable of employment as an effective instrument in the emergency of war and serve the purpose of an efficient military school in time of peace.

To the service at large, the adoption of this principle should be welcomed as the only basis upon which our efforts can be concentrated in the accomplishment of our common task and through which alone harmonious action can take the place of the internal wrangling that would forever defeat the most earnest efforts for efficiency. To this magazine, this phase of the legislation is a source of especial gratification as the embodiment of a principle for which it has contended since the date of its establishment. We have, however, no desire to lay claim to its final acceptance

as due to any representations on our own part; indeed the validity of the principle is so patent that it must receive recognition the moment that the military problem is given any serious attention. But all process of evolution is necessarily slow. A miscellaneous aggregation only comparatively recently assembled into battalions and at most regiments from scattered frontier company posts can scarcely be expected to view itself as a complete organism and make a muster of its deficiencies.

There will perhaps be some in whose eyes the shortcomings of the bill will loom up in overshadowing proportions against its predominating excellent features. But it must be considered that the task of the legislator is an extremely difficult one. He must not only view the question from the standpoint of military necessity, but also weigh the legislative practicability of the measures which he intends to present and rally support for his program. And anyone who has observed the course of the recent legislation in its meanderings through mazes of amendments and compromises cannot fail to bear away the conviction that viewed from the standpoint of what was considered possible a year ago, the provisions of the Act which relate to the Regular Army constitute in the main a remarkable legislative achievement.

The army reorganization is to be sure only an authorization, still to be realized. It is possible that it may never be completely realized. The tide has its ebb as well as its flow.

But it is enough for us for the present that an opportunity for the development of an efficient army has been given. For years, the army has turned expectant eyes toward Congress in the hope of the legislative action which has been taken. There is no longer any reason for this attitude; the army now has all that it can efficiently digest for many years to come. The present and the immediate future are periods for introspection and gestation. There will be no excuse on the part of the Army for failure to respond in full measure to the opportunity which it has been afforded. Its best efforts will be necessary to an efficient solution of the many problems which confront it.

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The Recruiting Problem.

Among the problems to which the new legislation gives rise, the one that is probably uppermost in the minds of most of us is the recruitment of the new regiments. Some additional inducements and facilities are carried in the new law which will doubtless aid materially in this respect. The employment of postmasters as recruiting agencies may increase the output, and the shortening of the period of service with the colors may attract more recruits. It is said that plans are under way for popularizing ideas on the nature of military service by means of moving pictures. This should prove to be an effective means of acquainting the public with the many fascinating possibilities of Army life.

But there is no doubt that this part of the problem will be efficiently handled. It is of more immediate concern to the Army at large to render attractive the actual conditions of service. Let us hope that in the new posts which may be established we shall have fewer expanses of faultlessly kept parks which require hours of daily tedious fatigue for their upkeep. In the selection of sites for future posts, the attractiveness of the stations from the enlisted man's viewpoint should be a controlling condition. This is a necessary consequence of our dependence on the voluntary system. Moreover, in these days of rapid transit, the location of a post from strategic considerations is diminishing in importance. At all events, we cannot expect enlisted men to give glowing reports of the Army to their civilian friends if we plant them in stations amid the monotonous scenery of some western plain where no diversions for the passing of leisure time are available and the society of the other sex is almost entirely lacking. The present service of our troops on the Mexican border, if long continued, will probably be a serious drawback to recruitment. This is a situation which we must of course accept and make the best of.

But it is not so much in the opportunity for diversion which military life affords as in the actual military service itself that the greatest opportunity for rendering the service attractive lies. We can accomplish much more in this direction by employing methods of instruction that arouse professional interest and

appeal to the imagination than in any other way. It is almost invariably the case that enlisted men respond to the concrete appeal of the applicatory method.

Some doubt has been cast upon the possibility of recruiting the newly authorized strength of the Army. Whether or not these doubts are well grounded is at present undeterminable. But it would seem that if Great Britain, with a population of only 40,000,000, and a rate of pay, compared with the industrial scale of wages much lower than our own, can in time of peace recruit an army of 250,000 men, it should be possible with our population and rate of pay to enlist a force of 175,000.

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The Dual Face of War.

In an article published in the April issue of *La Revue Militaire Suisse*, a translation of which appears in this issue of the INFANTRY JOURNAL under the caption, "Some Lessons of the War," Major Cerf, of the Swiss military establishment, discusses the adverse effect of some French tactical doctrines on the operations of the French troops in the present war. Among the chief of these was the tenet that pervades all French official instructions and most French military writings that fire is of importance only as an aid to movement. The effect of this view was to relegate fire to a secondary position and to cause the greater portion of the instruction of the army to be devoted to maneuver.

It is rather curious to trace the historical evolution of this doctrine. It may be recalled that prior to the Franco-Prussian War, French regulations were based on diametrically opposite principles. "To install and intrench oneself in positions with a clear field of view and with glacis-like slopes," said Colonel Montaigne in 1912, "summed up French tactical doctrines when the war of 1870 broke out. . . When we saw ourselves in possession of so powerful a weapon (Chassepot, model of 1866), we told ourselves that it was necessary to utilize that power and exploit to the utmost its two essential elements—range and rapidity—that is to say, the elements which prevent an assault." The adoption of defensive tactics as a principle of combat followed from this belief in the supremacy of fire.

But the war of 1870 clearly demonstrated the fallacy of this doctrine. The enveloping maneuver of the German armies nullified the power of fire upon which alone the French relied as the means to victory. In other words, movement had cheated fire of its prey. This has always been the great advantage of a flank or enveloping attack—that it places an adversary in such a position that he cannot make use of his weapons.

As a result of their experience in the Franco-Prussian War, it appears that the French veered to the opposite extreme: they transferred their confidence to the maneuver, and reduced fire to a secondary position. Apparently, this conception had the effect of decreasing the importance in which fire training was held, especially in regard to individual marksmanship. When the principle is stated in this form: "Fire is of importance *only* as an aid to movement," it is easy to understand how a belief in the relative unimportance of fire could rise. If, however, the principle be stated in inverse form: "In battle movement can be effected only through superiority of fire," the latter element is at once restored to a position of equal importance with the former.

Undoubtedly from a strategic point of view, that of higher commanders, the object of operations is to produce such a change in relative position of the two opposing forces through movement as will lead to the opponent's destruction. This is true whether the implements of combat be the modern firearm or the pike and sword of the ancients. Tannenberg and Angerburg demonstrate conclusively that the power of maneuver is as great today as at Cannae or Leuthen.

Prior to 1870, French doctrine viewed fire as the supreme element in war; subsequent to 1871 and prior to 1914, maneuver was given this position. And the strange feature of the comparison is that an inversion of the order of adoption of the two doctrines would have more accurately fitted the actual conditions: the doctrine of 1870 would appear to apply fairly closely to the trench warfare of today while the maneuver tactics for which the French troops were prepared were more adaptable to the conditions of the Franco-Prussian War.

The fact seems to be that it is impossible to subordinate either of the two elements, fire and maneuver, to the other. They are

the two great coordinate implements of military tactics whose combined object is the destruction of the enemy. In different phases of an action, one or the other may temporarily predominate.

A few years ago, we divorced ourselves from normal formations. Principles, not formations, it was said, should be taught. Today we are going a step further: we are comprehending that the danger of principles is almost as great as the danger of normal formations. We are learning that war is a trade that can only be learned—as far as it can be learned in time of peace—by action. In this consists the great value of the so-called applicatory system; it teaches or should teach mistrust of principles quite as much as reliance upon them. We believe that it is a perversion of that system to employ it as a means of teaching principles: to conteract the human tendency to seek support in fixed dogmas, it should almost be a general rule that an exercise which is conducted with a view to bringing out the necessity for a certain line of action should be followed by one in which exactly the reverse procedure is in order.

There is much ground for the contempt of so-called practical men for theorists. For it is too often the case that the theorist envisages but one aspect of a question and adopts one line of conduct which he seeks to make of the universal application. He often does not realize the dual nature of truth—that truth is both masculine and feminine—that sometimes fire, sometimes maneuver is supreme.

The wisest dictum of military tactics is perhaps the one which prescribes that a subordinate commander shall be informed as to the object he is expected to accomplish but leaves him freedom in the choice of means to the end.

Some Lessons of the War.[1]

By Major A. Cerf, Swiss Army.

Skill Dominates Force.

INTRODUCTION.

"Woe to him who gives up."

AROUND us, war continues its ravages. We Swiss are awaiting under arms the end of the terrible drama which is being played under our eyes.

But the wait is being prolonged, the wait which disturbs the mind and enervates courage. During the present epoch, deplorable errors are credited by public opinion, and dangerous doctrines are being propagated in the masses. They exercise a pernicious influence, for they either lull the people into a false sense of security or else they spread discouragement. And nevertheless, it is more than ever necessary to guard ourselves against the fatuous optimism of the one as well as the exaggerated pessimism of the other.

The former are those who have learned nothing and stubbornly persist in adherence to their dangerous chimeras. "We shall not fight! Let us disarm," they say in many different variations. We are familiar with these refrains, and with the misfortunes which they produced in Belgium and in France.

We shall not fight! What do you know about it? Are you in the secrets of the gods? in touch with the present and future plans of the General Staffs of the armies that surround us? But what use is it to try to undeceive these Utopians, to tell them to open their eyes to what is going on, to consider the fate of the peoples who had placed their confidence in the value of scraps of paper?. Who is not familiar with Bismarck's words: "All treaties are not worth a single cartridge!" And just yesterday a celebrated German author wrote: "Woe to the people who have not taken care of their house in time and who have counted on paper alliances and declarations, for Power alone gives the de-

[1]Translated for the INFANTRY JOURNAL from *Revue Militaire Suisse*, April, 1916.

cision, Vigilance and Force alone inspire respect from all sides." Is that not clear? But "there are none so deaf . . ."

Let us disarm! Let us demobilize! The powers which surround us are our friends, they only wish us well. We have a right to their gratitude for the numerous services which we render them. These are but idle words. The realities often give rude lessons to Utopians. We are at an epoch when appearances must not be trusted, when we must not be too trusting, still less, weak.

"I wish the men to know that it is a mistake to think that the danger is definitely removed. On the contrary, the present war is far from being finished; the longer it lasts, the more complications increase and the more numerous become the sources of conflict, the more our national pride, our sense of dignity should be elevated," we read in one of our divisional orders. (Order of the commander of the 2d Division, February, 1915.)

In this connection likewise, let us listen to the energetic advice of Lieutenant-Colonel Montaigne to his fellow-citizens a short time before the war. He spoke correctly, but alas! he was scarcely listened to—

Disarm, you say. More than ever on the contrary, we must arm. The pacifists say: "War is devastating, murderous." And instead of exhorting: "To protect yourselves against war that your firesides may not be destroyed, your children slaughtered, your daughters outraged, gird up your loins, steel your hearts! Be strong, he courageous! Arm yourselves against war," these madmen, as if the evils of war fell on the conquerors only, cry: "Lay down your arms! Emasculate your hearts! Be weak! Be cowardly! Slaves, behold your master, stretch out your wrists for the chains! Sheep, behold the butcher, offer your throat to the knife." (Lieutenant-Colonel Montaigne: *Vaincre.*)

But when you speak of these things, there are people who accuse you of loving war, of inciting to war. As if one could love war! And it is precisely in order to ward it off from our Switzerland that we must more than ever furbish up our arms.

Moral: Mistrust fate and have a care for yourself.

The doctrines of the pessimists are still more pernicious, for they make our fellow-citizens lose faith in themselves. "People, tell me what your faith is, and I will tell you whose the victory will be." We shall soon, alas! no longer believe in ourselves. The innumerable slipper-shod tacticians and strategists who

poison us with their sophisms are to blame for this. Big battalions, matériel, and machinery—these are the dogmas on which the new art of war will hereafter rest. Conclusion: we are conquered in advance.

Let us beware! It is a veritable moral disarmament that is in question. If we do not react against it, our people will be finally converted into "a disheartened warrior in armor," to employ the eloquent expression of a writer whose name escapes me.

Halt! We must not, as Lieutenant Bally has so well said, allow these imbecile sophisms foolishly put into public circulation to become implanted in our men. This is one of the objects of this article. The lessons which are drawn from the facts of war now known are such as to revive in us Swiss confidence and faith in ourselves. I shall appeal for the truth of this statement to the testimony of those who have taken part in the war.

Force dominates right, it appears. That remains to be proven. In the meantime, I claim that skill, today as yesterday, dominates force. I shall give proofs of this statement. Let us more than ever have a consciousness of our value. Raise up your hearts!

"It may be that for us without our suspecting it, the tragic hour is striking in the belfry of history."

If tomorrow, that tragic hour should strike, one thing is certain: we shall not have been the aggressors; that is why, as has been well said, we must not be the vanquished.

And we soldiers, who will be in the front rank to receive the blows, if war breaks out, we have the duty of considering coolly all possible eventualities and the right to prepare ourselves for them. We must march tomorrow to the fight with the conviction that we are equal to carrying out our task victoriously.

As commanders, we have, moreover, the imperative duty of studying the experiences of our neighbors in order to profit by them and to give our troops the benefit of them. We have been rightfully and repeatedly told that the only aim of the training and instruction of our troops was "preparation for war." But in order to prepare ourselves well for it, we must know what war is and strive to learn all its realities. "I have never been under fire," said Lieutenant Bally in this connection. "I am entirely ignorant as to what I shall feel the first day that I am under it. I also ask myself what my men will do, how I shall lead them, and whether I shall not then feel the bitter reproach of

having prepared them insufficiently for it. I would that I shall not at that moment have any reproach to make to myself."

Who is there among us who has not mentally many times pronounced these words? Yes, we cannot content ourselves with cheap suppositions or technical formulas learned on the maneuver field or in books; we must seek to learn and assimilate the experiences of the battlefields which surround us.

That being said, I confess that it would be presumptuous to attempt to comment on the events of the war with the purpose of deducing at the present time infallible doctrines of combat. Such is not my intention. The war is not finished, and it still reserves many surprises for us. Nevertheless, we must recognize that the experiences of our neighbors during these long months of war have profoundly modified certain methods of combat generally accepted and applied at the beginning of the campaign of 1914. New methods of attack and defense have necessitated the creation and application of processes which tactical regulations had not foreseen. Now it is extremely difficult to obtain information. The belligerents, as it is easy to understand, conceal their experiences in their own interests. Moreover, but little credit can be given to the innumerable accounts and wild tales which constitute a good part of what is called the literature of the war.

"It is not," says Ardant du Picq in "Victories and Conquests," "in the official reports that one must seek for examples. It is in the sincere testimony of the men who have themselves been in action and in acting have seen—a difficult thing." (*Etudes sur le combat.*)

So it is to the testimony of these men that I have had recourse as references for this article, which is only a commentary on the statements of commanders and soldiers who have seen and made war.

In this regard, a very interesting book which recently appeared in France, *Le Tir pour Vaincre,* especially moved me to undertake this study. The author, Commandant d'André, is not a theorist, he has participated in the war and has seen.[1] And that is why the experiences which he has published for the use of his fellow-citizens have also great value for us. Wounded three times at the beginning of the campaign of 1914, this officer employed

[1]See "Infantry and the Other Arms," in INFANTRY JOURNAL, December, 1916.

the leisure which his convalescence in the hospital at X allowed him, to write his book. The tragic disappearance of Commandant d'André when he was made prisoner on May 22, 1915, after sustaining a heroic siege for three days and three nights in the German trenches which he captured at the head of his battalion, is described in the beautiful preface by General Cherfils.

The *Tir pour Vaincre* by Commandant d'André is not only an eloquent plea in favor of individual fire, but also a refutation of many of the sophisms and prejudices which are current in public opinion in regard to war. It is an especially interesting study on the tactics of infantry fire.

"It seems to me," says General Cherfils, "that this little book sums up perfectly what the complete preparation of the man should be in order to obtain the maximum result from his capacity for 'firing to conquer.'"

This is exactly what we need, for I believe with Colonel Ardant du Picq that—

> The most minute detail observed on the spot in an action of war is more instructive to me as a soldier than all the Thiers and Jominis in the world who doubtless speak for the heads of the government and the armies but who never show me what I want to know, a battalion, a company, or a squad in action.

It is worth while to examine the ideas of Commandant d'André. There is here a valuable source of information from which we may profit.

I have likewise found on the same subject some few documents coming from different sources. However, they are more discreet in the other camp, and doubtless will not permit experiences, the knowledge of which might be useful to their neighbor, to be published before the end of the war.

However that may be, I believe that many of Commandant d'André's experiences and especially his counsels to his countrymen would find immediate application to us. I shall therefore reproduce extracts from his book and sometimes condense his interesting ideas and make of them the *"leitmotiv"* of my study.

Taking our inspiration from his experiences, we could much improve our methods of combat firing and increase the effectiveness of our fire. Innovations judiciously selected and adopted would, moreover, contribute toward assuring our infantry of a marked superiority over that of our neighbors. Finally, grounds are presented for fortifying the confidence of our army in it-

self, and that is an advantage not to be despised. More than ever, each of our soldiers must be convinced that our small army is or can be a powerful and redoubtable instrument of war, capable of contending with equal chances with the masses which might be opposed to it.

If I succeed in making my readers share this conviction, the object of this study will be accomplished.

THE EXPERIENCES OF THE WAR.

The Revenge of Fire.

"Fire has taken its revenge, and what a revenge!" writes Commandant d'André.

"We used to believe only in the tactics of movement. The rude hecatombs of infantry at the beginning of the campaign of 1914 have opened our eyes on this subject. Fire to kill exists only too truly."

To tell the truth, we have never doubted it. But it is consoling to learn that the realities of the war confirm the principles upon which our Firing Regulations are based. While in Switzerland all our methods, regulations, and efforts tended towards making accurate shots of our soldiers, in France, before the war, it appears that this important subject, the training of the individual marksman, was neglected. In respect to fire, they still held to the viewpoint of 1870.

Thus the "firing to kill" of which Commandant d'André speaks is doubtless that which the Germans practiced at the expense of his countrymen, for it seems that the latter in general scarcely knew any other kind of fire at the beginning of the campaign than fire to frighten.

The French artillerist displayed an incomparable skill in the handling of his famous "75." On the other hand, the infantryman was not equal to what might be expected from the improved rifle and unusually excellent ammunition with which he was supplied—

> It is beyond all doubt that for the most of our infantrymen, fire has been, so to speak, inexistent; that is, aimed fire, of course. Numerous, very numerous will be the men who after the war will have to confess never having fired a shot while looking along the line of sight. Only an élite escapes this criticism.

One might think that Commandant d'André paints things in dark colors. But that is by no means the case. Testimonials of numerous French combatants confirm his statements. The following are examples:

Another rush of 300 meters. A fusillade bursts forth. Shrapnel bursts with a crash over our heads. We lie with our noses in the ground and fire mechanically without quite knowing at what. ("The note book of a quartermaster sergeant.")

Three cartridges are left in my magazine. I fire at the highest sight elevation without seeing anything, like those who fire aimlessly.

Corporal L. of L. (Charles Foley: *La vie de guerre conte par les soldats.*)

The German trenches abandoned are occupied and thousands of cartridges are fired to prevent a counter-attack.

Quartermaster Sergeant X.

A tight place. We fire blindly while they aim at us as at pipes at a fair.

2d Lieutenant of reserve P. C.

But what is the use of multiplying these quotations? There is no reason for doubting the statements of Commandant d'André. The French fired badly. Let us see what their opponents think about it —

About 1 o'clock, we receive the first fire, says Captain of Landwehr, P. O. Höcker. French infantry has occupied the suburb and discharges the first hail of rapid fire at us. The bullets go hissing over our heads in the tree tops—st-st-bing-bing. The Frenchmen hold much too high.

And by the same author in regard to another incident—

But our position is at once revealed. And now the hail again commences. . . . They all shoot too high. Good soldiers for targets—every shot a hit.

And later on—

The apes over yonder can't shoot at all. All their fire is too high. The bunglers do not hit anything.

And from another witness; the scene takes place near Longwy—

Finally we see beyond a meadow valley a hill upon which the French were located. They were in shelter trenches, and one could only see now and then their heads and occasionally the

full dark figure of a man who was perhaps changing his place or observing. They were also in the bushes on the slope along the foot of which a railroad track ran. They were very minute targets, but there was time to aim carefully. We lay exposed in the open field . . . The Frenchmen delivered a heavy fire, but it was much too high, and it finally induced in us a feeling akin to carelessness and disregard. Their machine guns aimed better. (Albert Leopold: *Im Schutzengraben; Erlebnisse eines Schwäbischen Musketiers.*)

So it is still the old story of shots going too high which has already been spoken of so frequently in preceding wars.

The results of such fire can easily be imagined. Commandant d'André deeply deplores this condition of affairs and indicates the causes of it—

It is all due to the fact that we did not succeed in convincing the infantryman of the necessity for being a good shot. However strange that may appear, it is unfortunately true. The infantryman was inculcated with contempt for fire. What was the use of practicing? One will always have legs and courage for dashing forward. And go when I push you! The cannon supports us! . . . We have no idea what this indifference cost us at the beginning of the war . . .

In regard to target practice, the infantryman thought he was still in the age of black powder—to such an extent that numerous authors dared to write this heresy: "In war one does not aim!" And others added: "In combat it is better not to aim. The fire is thus better distributed . . ." To these apostles of skepticism, the Transvaal replied. But they immediately answered: "But the Transvaal doesn't prove anything." The present war has shown them in letters of blood the truth of the matter.

This pernicious doctrine also formerly had partisans among us. A few years ago, it dominated the firing regulations of the armies of Europe. On the theory that war is made with collectivities and not with individuals, collective fire or volley firing was almost exclusively practiced. The soldier was considered merely as a part of a sort of machine gun which was charged with sprinkling a certain sector with blind projectiles. It was the golden age of the theorists who loaded down our firing regulations with their learned computations of probabilities and complicated cones of fire. Fire was everything, the firer nothing!

The Anglo-Boer and Russo-Japanese Wars gave a serious blow to these pernicious theories "inspired," says Colonel Montaigne,

"by ignorance of and contempt for man." The lessons of these two wars were heeded, and accurate fire was restored to a position of honor, and the principle of the individuality of the firer became the basis of all firing regulations.

The French regulations were not an exception, for we read in Article 2: "Marksmanship is one of the most important parts of instruction." Again in Article 6: "The individual instruction of the rifleman is the basis of all firing instruction."

We must believe that before the war, these principles were a dead letter—

> Very rare were the infantry organizations in which target practice was held in honor. Fire, it was confessed, does not flatter. Almost nowhere was real firing to kill practiced . . . Was not a man declared mobilizable without having been on the target range more than three times?

In 1912, Lieutenant-Colonel Montaigne also uttered a vibrant cry of alarm. In a brochure which created a sensation, he protested vigorously against the retrogressive tendencies of the French school of fire and the ignorance or the apathy of the instructing officers.

"Today," he said, "we return to the former creed, and individual fire has ceased to exist. It is not believed that the skill of the soldier as a marksman is so great an advantage that it is worth while concerning ourselves with it, and we do not concern ourselves with it."

We know the consequences.

It would be likewise interesting to examine the firing and the experiences of our other neighbors. That would, however, take us far afield. Moreover, the documents are still lacking. It is, however, certain that in Germany as well as in Austria and in Italy, accurate individual fire was much appreciated before the war; the armies of those powers were carefully trained in this respect. Information from reliable sources enables us to state that in all these countries, the war has demonstrated the great importance of aimed fire and that they are striving every day to increase its effectiveness. I shall cite only one case.

In the *Revue Militaire Suisse* for the month of August, 1915, the author of the excellent article "Impressions of Germany," said, speaking of the fire of the Germans:

The German Regulations make superiority of fire depend on the correctness and precision of fire and not on its intensity. The peace instruction is given with such care that it does not vanish on the battlefield.

Who has not heard, moreover, of the exploits of the German "Fritzs" or the Austrian "Kaiserjägers," redoubtable marksmen of whom the French and Italians speak with such respectful admiration?

As for us Swiss, we have fortunately not waited for the experiences of the war to accord to accurate individual fire the attention which it deserves. In this respect, we enjoy a reputation which we cannot strive too much to preserve and—deserve. We read with pleasure in a French book (*Le Tir pour Vaincre*) words of praise like these:

> Firing to kill does effective work and, developed to the utmost, makes the weak the equal of the strong. On that account, little Switzerland is in reality a great nation, a powerful state, worthy of the respect of all.

The Germans also do not hold us in less high esteem in this regard, and I hope that all our other neighbors do so. In this connection, the article of the *A. S. Militär Zeitung* (No. 36, 1915) entitled "Appreciation of Our Firing Methods," is worth while reading. A German raised in Switzerland where he learned to shoot is mobilized. He returns to Germany and has rifle practice with his company before leaving for the front. His captain, seeing the brilliant results of our Swiss marksman, at once nominates him, it appears, as noncommissioned officer and instructor of rifle practice of the company. And captain tells his men that—

> Switzerland in consequence of its instruction in firing and likewise through the preparatory voluntary military instruction occupies the first rank among all the nations.

The correspondent who relates the incident adds:

> The Swiss who know the facts will probably read these sentences with mingled emotions; in any case they will scarcely be in a position to subscribe without reservations to the unconditional praise contained therein.

THE WAR OF MOVEMENTS.

"Everyone wanted to maneuver, no one wanted to fight." (*Le Tir pour Vaincre.*)

Commandant d'André criticizes the war of movements, the abuse of maneuver to the detriment of fire—

> The infantry had only prepared for a war of movements, but it had forgotten to light its lantern. . . . Only the forward movement counted! To these Utopians, the trenches of 1914 have replied!

In this regard, it is interesting to compare our regulations with those of the French.

Swiss Regulations: "Combat has for its object the destruction of the enemy (Art. 225.) Fire is the principal means of action; movement by bringing it nearer the enemy permits its effectiveness to be constanly increased." (Art. 226.)

French Regulations: "Fire action has only one object: to facilitate movement." (French Firing Regulations—Preface.)

It was this tendency of the French Regulations that Colonel Montaigne combatted when he wrote in 1912: "I contemplate 'firing to kill;' the regulations, 'firing to march.'"

With this state of mind, a tactics of movements was finally created which did marvels on peace battlefields. When there are no bullets in the rifles, "such beautiful things can be done, such fine movements executed, and such ingenious ways of fighting on maneuver fields invented." (Ardant du Picq—*Etudes sur le combat.*)

The tactics of imposing fear such as were employed in maneuvers or studied in the "Kriegspiel" of peace time in which the man, the weapon, and the terrain were ignored, were preferred to the "tactics of killing."

"Too many skirmishers (*tirailleurs*) not enough marksmen," (*tireurs*) wrote General Cherfiels in this connection.

The conversation of the wounded is an inexhaustible mine of lessons, even in tactics. War brings out all the mistakes of our former military preparation. Those which were the most serious were: the bayonet rush on all occasions and contempt for the hostile fire, then the denial of the effectiveness of our own fire. One error brought on the other, and both engendered a total indifference to fire, which fell into the most disreputable neglect. The war has somewhat changed the former formula of victory.

Formerly to conquer it was sufficient not to be afraid of being killed. Accurate weapons have modified this adage whose wisdom has become insufficient. With accurate weapons, fire can be accurate, and if it can be, it should be. It is not a question of being killed; one must kill his opponent. (*Echo de Paris*, February 4, 1915.)

The French must have had some severe experiences, heavily paid for at the beginning of the war. Must we conclude that on the battlefield all movement is hereafter impossible and that the defensive must be preferred to the offense? By no means—

Some have dared to say: Fire paralyzes the forward movement. The fire of bunglers does so but not the fire of good shots since the latter clearing the space in front of the rifle is irresistible.

Everything is movement on the contrary.

If our man—whom we would have a skilled shot—goes forward, he advances from cover to cover, not in order to secure better protection (defensive mentality) but in order to aim more effectively (offensive mentality). If he advances, it is not to frighten his adversary and cause him to flee but in order to be closer, to fire better and more accurately, to fire more rapidly and with more certainty. (Commandant d'André: *Le Tir pour Vaincre.*)

Could one ask for a better confirmation of the value of the principles of our regulations?

OFFENSIVE OR DEFENSIVE?

Much is said at the present time of the "failure of the offensive." It is ridiculous to attempt at this stage of affairs to offer a solution on a question which is not ripe for discussion and for good reasons. At most, an attempt may be made to elucidate it by comparing the facts of war now known.

A French correspondent has attempted to do so in an article in the *Revue Militaire Suisse* entitled, "The French Regulations under the Test of War" —

French and Germans have conformed to this principle (principle of the offensive) with remarkable consistency. They rushed upon each other with an admirable courage and a ferocity that cannot be questioned.

But if brilliant success, at the beginning at least, crowned the application of the doctrine of the offensive, not less striking repulses later on have brought in question the infallibility of these universally recognized principles.

What is certain is that in all cases success and failure have been dearly paid for—

The absolute theory of the tactical offensive in all cases and at any price has cost the French as well as the German armies the flower of their youth of the first line, officers as well as soldiers. (Colonel de Payerne. *La Guerre Actuelle.*)

On the German side, a witness already quoted, also recognizes that the unvarying application of the "forward urge (Drang nach vorwarts), forward on the enemy, cost what it may" of the regulations was the cause of heavy losses in the present war." (*Revue Militaire Suisse,* August, 1915.)

There are obstacles which no offensive can shatter.

It is useless to illustrate this by examples which are only too well known. The evolution of the art of war, induced by the power of fire, the utilization of the terrain, and temporary fortifications have restored to the defensive an unsuspected power. And this development, whatever may be said of it, should not be displeasing to us Swiss. It is of course less than ever a question of sheltering ourselves behind formidable and costly *permanent fortifications,* which have incontestably failed in Poland and Belgium. But we must know how to adapt ourselves to the new circumstances and utilize them for the necessities of our cause. We must more than ever train our men in the *handling of their weapons and entrenching tools.* And while continuing to inculcate in them the clearly offensive mentality of which Commandant d'André speaks, it is well to familiarize them with the principles of the unyielding defensive which may be imposed on us. These principles are, moreover, not new and may be summed up as follows:

(*a*) A good shot never allows himself to be assaulted or dislodged from the position which is intrusted to him.

(*b*) Any position is impregnable when it is held by soldiers worthy of that name.

This is doubtless what Colonel (pseudo) de Payerne wished to impress on us when he said:

Switzerland, let it be remarked in passing, is henceforth unattackable even by forces four times greater than she can put in the field.

Let us take these words for what they are worth. It is none the less true that this new lesson of the war is not of a nature to diminish the confidence which we should have in ourselves. This statement deserves to be made known, for it is reassuring.

EVERYTHING FOR THE CANNON—NOTHING FOR THE OTHERS.

"The artillery does the whole task, and the infantry advances only when the former tells it: 'Madame is served!'"

A very widespread opinion has it that only the cannon, large and small, and the machine guns do useful work in the present war. They have the exclusive monoply of fire! The infantryman is more and more relegated to the act of the bayonet charge and has only the honor to be—a target! This opinion, of foreign importation, finds, alas! credence with us and will soon pass to the rank of a dogma in certain quarters. That can be understood in the case of our neighbors to the west but not in the country of William Tell.

We have indeed seen that the French infantry made a poor reputation in the use of fire. During this time, on the other hand, the artillery played an extremely brilliant rôle and created a reputation for itself which it deserved. As to the infantrymen, they counted only thenceforth by "the number of their legs and the length of their bayonets." Comparisons did not fail to be made, and conclusions with which we are familiar were drawn from them. It was inevitable, but that proves nothing. The infantryman who is a poor shot lacks confidence in himself; being incapable, he relies on others, the cannon, machine guns, and aviators, to do his work for him. Afterwards he has nothing to do but leap to the assault and occupy the ground thus cleared. This new method of combat is much too simple—

That will not do, bunglers, (exclaims Commandant d'André.) Reduce a combat henceforth to an artillery duel followed by a bayonet rush! No, a thousand times no. The last word will always be with the infantry, real infantry, who are real riflemen. That sometimes in particular cases, in trench warfare for example, the infantry has only to leap out and give the final blow as soon as the artillery has breached a way for it, is entirely correct. But to take this very special trench warfare as a basis for the deduction of the formula of the combat of tomorrow would be the most dangerous of Utopias.

That is the essence of common sense. The artillery accomplishes *its* task and not the whole task. To overturn obstacles, bar the approaches of the battlefield, in a word support the infantry attack—that is its task. For that purpose, cannon of all calibres are necessary. Have we them? Certainly and very good ones with which we can do excellent work. And if we lack the heaviest types, we believe that at the necessary time the gap would soon be filled by the neighbor who would inevitably become our ally to combat the invader of our territory, whoever he may be.

As to machine guns, their number cannot be too much increased. It may not be inapropos to remark that this weapon also constitutes part of modern infantry. It accompanies that arm everywhere, uses its ammunition, and employs its firing methods. To be really effective, this weapon ought not to be intrusted to a bungler but to an expert shot who fires the aimed bullet. Thus understood, it is nothing but an automatic rifle brought to perfection in the hands of a good shot.

Moreover, these distinctions are entirely idle. All arms are united on the battlefield.

THE BAYONET.

"It is the bayonet which is fixed in the rifle and not inversely." (*Le Tir pour Vaincre.*)

The importance of bayonet combat has likewise been greatly exaggerated by our neighbors. Let us see what Commandant d'André thinks of it—

There has been a tendency in recent years to diminish the importance of infantry fire. This deplorable view has only too often led the infantryman to take his rifle for a simple bayonet handle. The school which propagated this heresy throughout the nation perhaps believed, however, that it thereby fostered the offensive. Let us give credit to its good faith, but let us recognize that it was wrong. It actually accomplished pernicious results.

Bayonet fencing before rifle fire? That is a point of view of the good old times.

In 1913, the French correspondent of the *Revue Militaire Suisse* protested against this tendency, which was becoming more and more pronounced in France, to consider the bayonet as the principal weapon of the infantryman—

People appeared to believe in bayonet combat, in its usefulness. They wish to appear to believe in it, I should have said. It is not the moment when our infantrymen who need to be good shots and who do not know how to use the rifle as a missile weapon, it is not at that moment that we can seriously think of teaching them to use it as a thrusting weapon. All these regulations on bayonet fencing are additional deceits; it is not by these means that an army is prepared for war. (*Revue Militaire Suisse,* March, 1913.)

It appears that at the beginning of the war, some fine bayonet charges were seen—on the part of the French, of course. But according to what is reported, these experiences must have been cruel—and conclusive. One should read in *Le Tir pour Vaincre* of the means employed by the Germans to foil the bayonet attacks of their opponents and to "incite the *furia-francese* to fall into the trap which they laid for it. A book will doubtless be written after the war on this subject to set forth these facts which our wounded have already related."

And Commandant d'André exclaims: "When will we have confidence in the fire of our rifles. Soldiers, what were we doing with our cartridges? And we leaders, what were we doing with our soldiers?"

At present, bayonet combats are the exception. They are almost entirely replaced by attacks with hand grenades. The authentic statements of combatants are in accord on this subject—

Bayonet attacks are almost never made; they are very exceptional, and fortunately so, for at such moments the nervous tension is so frightful that no soldier would resist three months of war. (Narrative of a soldier.)

What conclusion should be drawn from these facts? Is it to be inferred that charges with the *arme blanche* either of infantry or cavalry, are to be forever excluded from modern combat? I do not think so. The bayonet always finds employment in night attacks, in fog, and in the woods. Bayonet fencing, when sufficient time is available, ought not be neglected in the training of the soldier. It is in the first place an excellent gymnastic and suppling exercise. It strengthens the assurance of the soldier, increases his self-confidence, and stimulates his spirit of offensive and decision. An infantryman should know above all how to shoot; but to be really, fully trained, he should also handle his bayonet skillfully, and have the will, to use the expression of

Colonel Montaigne, "to go and plant it in the breast of the adversary who has not been destroyed by his fire."

To sum up, Commandant d'André has well said the infantry officer should imbue himself thoroughly with these two means of action which he should always have in hand—fire and shock—in such a way as to know how on propitious occasions to make intelligent use of one or the other or both at once as the case may require.

Another word. Our men often form a false idea of bayonet combats and are prone to believe in their own inferiority. They have been made to believe too much that our bayonet was of no use and that their eventual opponents would all be redoubtable fencers and all that. Error! In combats *corps-a-corps,* the weapon is nothing, the man is everything. Our fathers, who were masters of this kind of fighting, raised havoc with their crude clubs in the ranks of horsemen equipped with the most improved weapons. Moreover, the French themselves, who were reputed to have the best bayonet in the world, are no longer in accord as to its suitability. One of them, Commandant de Civirieux, writes:

> In France, the bayonet is a little sword, too heavy and too long. It weights down the muzzle of the rifle and is not suitable for combats *corps-a-corps,* such as are fought in narrow trenches. It will doubtless some day be transformed into a knife bayonet of the type of those in use in several foreign armies. (*La Bataille, Je sais tout,* January, 1916.)

These words caused me some astonishment but—everything evolves. As to the bayonet fencers, on what side are they the most numerous today? Are not the rôles inverted? I suppose they will rather be thinly scattered (these fencers of yesterday) through the armies which might be opposed to us tomorrow. And for a reason!

QUANTITY OR QUALITY

"The Lord is on the side of the battalions."

Among the dogmas of the new art of war which it is desired to impose on us, there is none more generally admitted than that of the predominance of masses and matériel. Big guns, big battalions. Numerical strength and technique! That is everything! Men count only by their numbers. If such theories are

true, there remains only one thing for us Swiss to do—lay down our weapons, cross our arms, and resign ourselves to fate, we are beaten beforehand!

But no, the dogma is false. The appearances are deceitful, and nothing must be judged prematurely. We know the history of the "steam roller." There will perhaps be others. Let us await the end of the war. For the present, let us see what the professionals think about it—

The journalist often sees with a superficial eye only the results of matériel (mechanism or output) which hypnotizes. He only hears a bell! . . . . He often goes so far as to draw the attention of the reader only to the number and the power of matériel; boats, cannon, dirigibles, power of destruction of a new explosive, etc.—mechanism and pyrotechnics—all as an attachment to the mass of troops, army corps to be moved; in one word, matériel. And it is thus that public opinion, deceived by the daily reading of a penny newspaper, forgets the man. (Commandant d'André: *Le Tir pour Vaincre.*)

These theories are not new. They recur periodically in history after having been strikingly and repeatedly refuted. "In war, the human factor dominates all other factors by a hundred cubits." (Montaigne.)

The celebrated writer, Ardant du Picq, once wrote these words, which one could believe were dated today:

The theory of the big battalions is a shameful theory. From the most insignificant to the greatest orator, everyone who talks about the military today speaks only of masses. And in the masses, the man disappears. People no longer see anything but numbers; they forget quality, and nevertheless today as always, quality alone finally carries through the real action.

Bernhardi also expressly places quality before quantity. These are his principles as summed up by Colonel Feyler under the heading, "The German Strategic Doctrine and the German General Staff:"

The army will strive for superiority of maneuvering power. That is more important than numbers. The active troops will be so organized and instructed as to obtain victory. Quality will be preferred to quantity. The infantry especially will be made the best in the world from a tactical viewpoint, and only formations perfectly practiced will be employed in the decisive campaign.

"Such are in a very condensed translation," says Colonel Feyler, "the fundamental principles of Bernhardi. It will be observed that they have served as the basis of all the recent military reforms of the German Empire."

History is full of examples which would permit us to prove that in war quality has always finally prevailed over quantity. The campaigns of the great generals, Alexander, Hannibal, Cæsar. Napoleon, the celebrated victories of our ancestors, the old Swiss, what are they if not the signal triumph of quality over quantity? And David against Goliath? It may perhaps be objected that the times have changed; the tragic fate of Belgium, Serbia, and Montenegro will be cited. The objection has its value without doubt, but some reservations are necessary. Was Belgium indeed quality? One may justly admire the heroic defense of this little people who had to struggle under very unfavorable conditions. Those who are familiar with the state of affairs in Belgium before the war will tell you that this nation was surprised in a deep pacifist dream. Divided by the quarrels of the Flemings and the Walloons, enfeebled by the doctrines of the anti-militarists, entirely absorbed by its commerce and and its industry, the nation thought it was sheltered behind the ramparts of its fortresses. It lent an unheeding ear to those who warned it of the daily increasing danger. The army, unpopular, almost despised, insufficiently armed and organized, could not help suffering from this state of affairs. That is why one cannot too much admire the exploits and the stubborn defense of this Belgian army, engaged in an unequal conflict.

As to Serbia and Montenegro, they were victims of circumstances which are beyond the limits of human power. It must not be forgotten that Serbia twice completely defeated the Austrians who were much superior in numbers and repelled them beyond its frontiers. It is said that these two campaigns present for the guidance of our country the most admirable lessons of strategy and tactics that can be imagined. Attacked on all sides by powerful enemies, betrayed or abandoned by their allies, these two countries finally succumbed, crushed by an unavoidable fate. But these are defeats which honor the vanquished and which are equivalent to victories. We Swiss have known defeats of that kind at Mariguan, Saint-Jacques, etc.

The nations which suffer them arise stronger than ever. It is to be hoped that this will be the case with the valiant little nations which I have just mentioned.

God grant that a struggle may not one day be imposed on us under such favorable conditions. Everything is doubtless possible, but our strategic position permits us to believe and to hope that the stubborn resistance which we would oppose to the invader, whoever he may be, would bring us victories which would not be sterile.

THE MASSES.

One word more. Much has been said about attacks *en masse*, in deep columns by one or the other of the belligerents. Is this perhaps a discovery of the new tactics? On the part of the Germans, a witness denies these stories. One seeks to explain them:

> The Germans have not returned to the age of the pike or the javelin; "the attack in deep masses" of the newspapers is the attack in depth in which the echelons (reserves) are near enough to each other to reinforce the first line (firing line) at the proper time. . . . These successive lines of skirmishers, constantly approaching nearer to each other, appear, when viewed from the hostile position, as a compact mass. This is what has given rise to the legend of the resurrection of the ancient phalanx.

In the other camp, it is stated that on many occasions, the Germans attempted attacks with soldiers grouped in compact masses. That is possible. The first-line troops of the belligerents were destroyed in part in the first battles. They have been replaced by troops of the second and even the third line which it is said are unreliable and have not in any case the cohesion of the first. To give these improvised warriors the indispensable cohesion, it has often probably been necessary to abandon extended order and to accept the close order of deep columns, *the mass*, which Ardant du Picq calls the infancy of the art.

"Troops which close in to fight are troops whose morale is weakening," says that writer. Napoleon in his last campaigns, also employed the tactics of masses which he condemns in his memoirs.

"When the good troops were used up," Ardant du Picq explains in this connection, "when the generals thought they could

no longer obtain from their young soldiers attacks with solid tactical dispositions, they tried the mass, they returned to the mass, which is the infancy of the art, a resort, as it were, of despair."

Moreover, if we accept Commandant d'André's statement, the Germans were able on certain occasions to grant themselves the luxury of making mass attacks with impunity. Even in close formation, the nearer one approaches, the less danger there is in assaulting a body of infantry which practices "scare-crow" fire, fire to create fear, which sends the bullets at random over the heads of the assailants.

The Germans doubtless made the experiment, and that is why Commandant d'André concluded laconically: "What little importance the enemy must have attached to our infantry fire to dare to advance on our soldiers in such vulnerable formations!"

Under such conditions, attacks in any formations whatever could not fail to succeed. The defenders probably did not await the assault before turning their backs, for "lack of skill in marksmanship engenders in the combatant the feeling of his own incapacity and weakness, from which follow pusillanimity and cowardice."

On the other hand, to oppose to these human waves some calm marksmen, sure of themselves, some machine guns armed by selected men of cool nerve, is the instantaneous destruction of the mass, the infallible complete victory of quality over quantity. There is no better demonstration of the value of accurate fire, fire to kill, or to make use of a happy expression of Commandant d'André, "of the redeeming fire which makes the weak equal to the strong."

Notes on Road Curves.

By Colonel L. W. V. Kennon, Infantry.

AN ARMY wagon can be turned on a radius of 17 feet; allowing 2 feet for ditch, which serves also to keep hubs and single-trees away from the bank, 19 feet may be taken as the minimum radius of the inner edge of a road intended for the use of army transportation. As the army wagon and its team is about 7 feet in width, a minimum of 14 feet is needed on tangents for the passing of teams traveling in opposite directions.

The supply of an army requires the movement of transportation in opposite directions. If two parallel roads between the termini exist, one should be restricted to outgoing, the other to incoming trains. In country where few, poor, or no roads exist, roads must be improved or built. One road of sufficient width to enable teams to pass will, under almost any conditions, be cheaper and quicker to build than two roads. Military roads should therefore have a minimum width of 14 feet; preferably, where cost and time allow, a greater width is desirable, especially in view of the use of the road by wide motor trucks. The quick movement of transportation at times also suggests wide roads to afford a fair margin of safety.

The distance from the front axle to the heads of the wheel mules is about 13 feet. The front axle is taken because the rear wheels track.

Ordinarily army wagons are drawn by four mules; artillery requires six and eight animals. Tractive power is transmitted by chain; therefore in order that the whole team may work, the chain should be in prolongation of the pole; otherwise an undue burden is imposed on the wheelers, and this condition will obtain when rounding turns in the road, unless properly provided against.

It is hardly practicable for teams to pass on turns unless the angle of deflection is very small. This discussion will therefore apply only to the form the road should take at turns to enable a single team to make the turn without material loss of power.

The constants of the road having been determined, the only data required to lay out the curves are those given by the survey notes and the assumed radius of the inner curve.

Several formulas have been used for location of road curves, but the following are as simple as any and are designed to enable the curves to be marked on the ground when the adjacent tangents are located.

The location of the tangents determines the P. I. and the angle of deflection. In Figure 1, let APA' be the center line of the road, the P. I. at P.

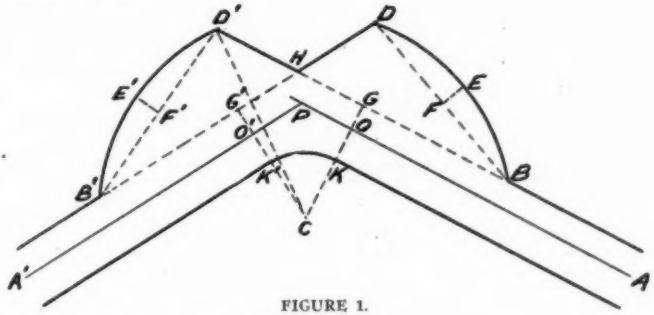

FIGURE 1.

Let R = the radius of the outer curve.
" r = the radius of the inner curve, including ditch.
" l = the length of team, measured from front axle.
" a = one-half of the angle of deflection.
" c = width of team and wagon.

From the evident relations in the figure, we have:

(1).....$R = \sqrt{l^2 + (r + w)^2}$

(2).....$PO = (r + \frac{w}{2}) \tan a.$

(3).....$GD' = GB = G'D = G'B' = \sqrt{R^2 - (r + w)^2} = l$

The field work is obvious. The sides of the road having been staked off, from P lay off PO and PO'; at O and O' erect perpendiculars intersecting the sides at G, G', K, and K'. The two latter points mark the P. C. and P. I. of the inner curve.

From G and G', lay off CB, CD', $G'D$ and $G'B'$; B, D, D', and B' are points of the outer curve.

If the arcs BD and $D'B'$ are long, intermediate points may be determined in various ways. The following method has been used: Measure the chord BD and mark the middle point F. Divide the half chord by R. The result is the sine of one-half the angle subtended by the arc BED; look for this result in a table of

natural sines and subtract the corresponding cosine from unity. This result multiplied by R will give the ordinate FE and $F'E'$ and determine the points E and E'. Other points may be determined in like manner, but with BED fixed, the curve may be set in by eye, with the aid of a string and small stakes.

If no tables are at hand, the middle ordinate may be found by measuring the half chord $BF = n$; the middle ordinate $= x = R - \sqrt{R^2 - n^2}$.

In the example, the minimum road width and inner radius have been taken, because in mountain countries, these limits are often imposed upon the road builder by topographical conditions. In more favorable localities, the assumed elements may be taken so as to minimize the work at curves or to eliminate it altogether as far as widening is concerned.

It is evident that if $w = R - r$, the half chord BG reduces to zero, and the road will need no widening at the curve.

Attention is invited to the form of the road as shown in Figure 1. The common rule is simply to "widen the road at curves," and it will be observed in many roads that the widening is done opposite the P. I., just where it is not needed; neither animals nor wagons enter the space DHD', and the labor expended in widening the road there is labor wasted. In cuts or fills, this waste in labor and cost is sometimes very appreciable.

No widening will be required where the angle of deflection is small. For each road width, there is a maximum angle of deflection under which no widening is necessary.

In Figure 2, let P be the P. I. of two tangents OP and PO', having an angle of deflection $APD = OCO' = 2a$; $OBDA$ the team, with the head of the off leader at A, on the outer edge of the road. Draw CO and CO', prolonging the latter to G, on the outer edge of the road. Draw AG and AC.

In the triangles AGC and AOC, the difference of the angles OCA and $GCA = OCG = 2a$. This is the largest angle of deflection for which no widening of the road is required. The value of $2a$ varies with the width of the road. The following values have been computed to the nearest minute:

For road width of 14 feet, $2a = 9° 53'$
For road width of 16 feet, $2a = 12° 59'$
For road width of 18 feet, $2a = 16° 16'$
For road width of 20 feet, $2a = 19° 45'$

In these computations the minimum radius of 19 feet was used; the length of team assumed at 43 feet and its width 7 feet.

Every driver likes long tangents and easy curves, and while conditions may force the road builder to adopt minimum values of r and w, it is far better practice to ease the curves so that widening the road will be unnecessary. For each normal width of road, there is a minimum radius above which no widening will be required.

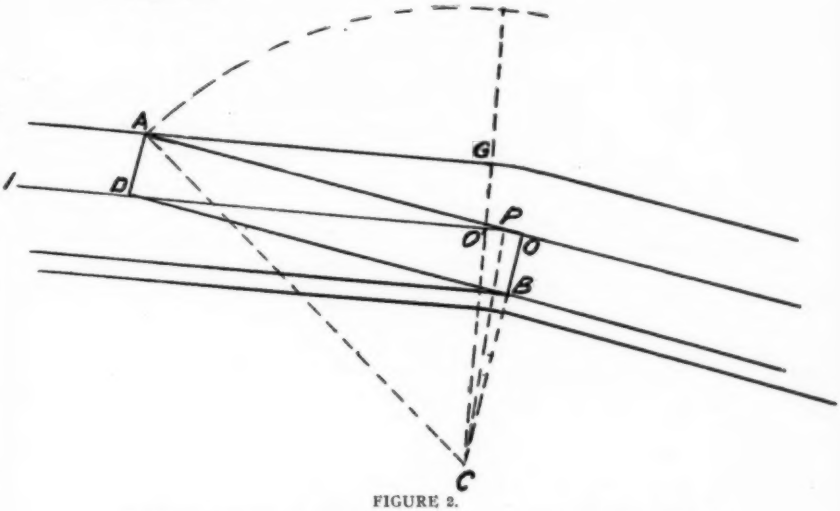

FIGURE 2.

In Figure 3, let the team $ABDE$ be on any part of a road inclosed in the arcs IFA and KDK', the head of the off leader being at the outer edge of the road.

From the relations shown in the figure, we have:

$$R^2=(r+c)^2+l^2$$
$$R=(r+w)$$

From these equations values of r may be computed. No widening will be required when the length of r is approximately as follows:

For road width of 14′, r = 120′
For road width of 16′, r = 90′
For road width of 18′, r = 70′
For road width of 20′, r = 56′

These lengths are a trifle in excess of computed values.

The rules given in the Engineer Field Manual (page 266) are rather indefinite and not strictly accurate. The rules above given have proved satisfactory in practice, and not only tend to economy in construction but to ease and safety of team, driver, and load.

The same principles apply to the approaches of bridges; from neglect of them, many animals and much property were formerly lost in the ravines and rivers of the West.

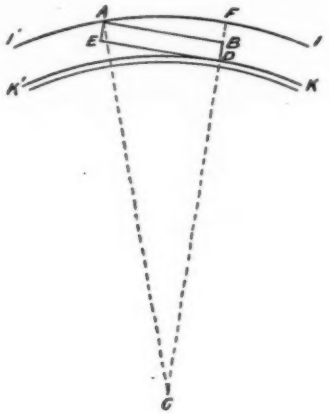

FIGURE 3.

In proper constructions, curves should be levelled or the grade reduced below the maximum allowed for the road. Some power is lost at turns, even if the team is kept in line.

All roads must nowadays be adapted to motor traffic; with the higher rates of speed of these vehicles, the cross sections of the road requires modification to meet new conditions.

In a railway, the outer rail is elevated on curves. The same principle should be applied in the construction of all roads, which at all turns should slope toward the inner curve, and with absolutely no slope toward the outer curve.

Good drainage is one-half of good road construction, and the ditch to carry off storm water is an important item. In mountain roads, it should be wide and shallow rather than deep, and tri-

angular in cross sections, as shown in Figure 4. A width of 2 feet and a depth of six inches has proved satisfactory.

The advantage of this form is that should a wheel get in a ditch it may readily be pulled out; with motor cars, this is especially important.

FIGURE 4.

If the road be metalled, the surface should be sufficiently rough to provide secure foothold for horses. A smooth oiled surface lessens tractive power, and is a frequent cause of accident and injury.

Supplies and Transportation for Troops in the Field.

By Captain A. E. Williams, Quartermaster Corps.

WHEN the Tables of Organization were first received by the Army and put into effect, the assignment of field transportation prescribed therein was freely criticized. Company commanders objected because their wagons had been taken from them; quartermasters objected because they thought wagons would not be sufficient to carry all regimental equipment.

I believe that the number of wagons authorized in these tables is sufficient, provided each officer and each organization is permitted to take into the field only the articles prescribed in orders. But this is where the difficulty arises; it is easy to prescribe theoretically what should be taken on field service, but it is entirely another proposition to enforce a strict adherence to the number, kind, and weight of articles authorized to be taken. Indeed, it is almost impossible to prescribe definitely what shall be taken into the field on account of the varied climatic conditions existing in the United States.

When troops were ordered to Texas in February, 1913, all received the same instructions, and yet the variety of equipments taken was limited only by the number of organizations ordered there; some took coats, others did not; some took overcoats, others did not; some took ice boxes, others did not; the officers of some organizations took sabers, others did not; some regiments took six-line teams, while others took four-line teams only; so it was with many other articles of equipment and uniform. The above is cited as an example of what actually happened; it is not a question of theory, assumption, or hearsay.

To return to the question of field transportation: While on duty with troops in Texas and Mexico, I served as regimental quartermaster, company commander, and battalion commander, and so had an opportunity to observe the handling of field transportation before and after the Tables of Organization were put into effect.

There were various methods of handling regimental field trains

under the new system. It was observed that some wagons in a regimental train were overloaded, while others had only half loads. In some cases, one baggage wagon was assigned to each battalion, and the loading of these wagons put under the supervision of the battalion commanders.

Drifting now from cold facts into the realm of theory, I believe that under the new system, the regimental quartermaster should have absolute control of loading of all field wagons, the organization commanders being instructed to have the articles authorized to be transported in baggage wagons, ready to load at a fixed time and at a designated place, and the regimental quartermaster to have these articles collected from the various organizations and wagons packed under his supervision or under one of his commissioned assistants.

There will be ample room for all the authorized articles of field equipment in the wagons of the baggage section, but not sufficient for all that the organization commanders will want to carry and insist on carrying. There is always more or less confusion in placing and loading the wagons on the first day of a march. This will not continue, however, if it is definitely understood that wagons will be loaded in the same order and in the same manner every day during the march, no instructions to be issued after those for loading on the first day. If this is managed in a business-like manner, no trouble should be encountered, even with the company commander who is inclined to object to everything on general principles.

As to the ration section, eight wagons have been more than are necessary to carry required rations on the marches in which I have participated with organizations at peace strength. However, I have heard some company commanders make a good line of criticism on the handling of this section. One incident I have in mind is that of the leading regiment of a brigade which reached its company ground about one o'clock and which was not issued rations till after three o'clock. It was on the first day out, and the quartermaster had not perfected a plan of issuing rations promptly. Under the old system, as soon as a company wagon neared camp, there were men from the company ready to escort it to its proper place and unload it promptly, being careful to get cooking utensils and rations out first so that the cooks could get the first meal started. Under the new system, details for

unloading and issuing rations must come from the regiment at large, and all organizations receive issues at the same time, all of which causes delay.

This brings us to the subject of giving instructions and making details for handling baggage and rations while on the march. The quartermaster or supply officer, as staff officer for the regimental commander, should be able to give his instructions just as the adjutant does, by direction of the regimental commander, being sure always to know and follow the policy of his commanding officer. In some regiments, the adjutant attempts to run the loading of wagons as well as every other little detail, and in order that the quartermaster may cause any instructions to reach a company commander, he must go to the adjutant, who issues them by direction of the regimental commander. That should not be necessary; if the quartermaster and adjutant are in touch and working harmoniously as they should, when some verbal instructions are necessary regarding supplies to be issued to an organization, the quartermaster should give them by direction of regimental commander without having to consult the adjutant. This would require a mutual understanding between the two staff officers, which would be facilitated if they live together while on the march; they would then have an opportunity each night for exchange of views on the day's work and to discuss plans for the next day's march.

I am loath to leave the subject of field trains without first calling attention to the great superiority of trucks over wagons for service in our regimental field trains. Unfortunately, the authorities do not believe in trucks for this class of service, doubtless because they have not witnessed the performance of machines in field service. The following is the announced policy of the War Department: "That the field trains that accompany the troops had best be animal-drawn vehicles, but the divisional trains, supply, ammunition, and sanitary trains should be trucks." Following the above policy, the Department is replacing animal-drawn vehicles with trucks everywhere possible except in the field trains. I think it is because those who formulate the policy are not aware of the efficiency of certain types of trucks operating over all kinds of terrain. I would not hesitate to take a truck train anywhere a mule train can go and it would not be necessary to call for the assistance of mules to do so. Trucks of the four-wheel

drive type should be supplied for field trains in place of mules as the latter become unserviceable.

When the three departments were consolidated into the quartermaster corps, I think it was intended that regiments should do likewise, that is, consolidate the duties of quartermaster and commissary in the regiment, but this was not done until regimental commissaries were given command of the machine-gun companies, and even then in some regiments the commissary still handled the rations in addition to his other duties. One captain can handle the supply of a regiment in the field very easily with the assistance of three lieutenants. I think this arrangement is far more satisfactory than having two staff officers responsible for supply of rations, one to haul them and the other to issue them. The three lieutenants should not be assigned to battalions but to the supply company under the direct orders of the quartermaster; should a battalion be detached from the regiment, a supply lieutenant would of course go with it as quartermaster.

In order to give the officers of the supply company proper training and necessary practice, the supplies for troops in garrison should be obtained in the same manner as when the troops are in the field. The regimental quartermaster should draw both rations and other supplies in bulk from the post quartermaster and make issues to the organizations, the post quartermaster being in position of a depot quartermaster. Then when troops are ordered into the field, everyone will be familiar with duties required of him—the machinery of supply company will be in working order and well oiled. This applies to handling of clothing as well as other supplies; no more paper work in connection with accounting for supplies should be required of the regiment in garrison than in the field, and accountability should end when the clothing leaves the warehouse.

The Department has found it advantageous to issue blankets, overcoats, sweaters, and some other articles on memorandum receipt rather than as part of the clothing allowance. There seems to be no good reason why this procedure cannot be applied to all articles of the soldier's clothing and the clothing allowance eliminated. The Government should of course retain ownership but require no returns after issue to the regimental quartermaster, and the company commander should keep account, in the company records, of each article of clothing from the time it is

received until worn out and dropped. When a man leaves the service, he should be required to turn in all his uniforms, those fit for re-issue to be renovated and used again. I would recommend further that the uniform for our army be reduced to one, the olive drab or a serviceable gray—whichever may prove to be most suitable for field service. This should apply to officers and enlisted men alike; when off duty or at social functions they should be allowed to wear the civilian dress appropriate to the occasion. Then anyone not in the service of the United States should be prohibited from wearing any part of the uniform of a soldier or anything similar to it.[1] Porters, bell boys and teamsters will not then appear in the uniform of generals of the United States Army.

By adopting one uniform, we should no longer be burdened with the expense and care of the dress, full dress, full dress mounted, social evening dress, and mess jacket. Let us hope that the board appointed to make recommendations on this subject will give us one distinctive uniform.

[1]This reform is accomplished by the Army Reorganization Act.—Editor.

Economy in Sheltering Troops.

By First Lieut. Robert C. Cotton, Signal Corps.

A GENERALLY accepted definition for "economy" is "frugality of expenditure;" hence "economy in sheltering troops" may be said to be the frugality of expenditure in the erection, upkeep, and maintenance of shelter for troops.

By shelter, we do not mean permanent housing, although some of our soldiers, now with the colors, have completed one enlistment period and have entered into a second without having had the comforts of barracks during this entire period of years. Our concern, for the present, is not the question of barracks and posts, costly or otherwise, but the problem of sheltering troops without the comfortable confines of the permanent station—the field abode.

At present, we have many types and sizes of tents, flies, and paulins. All of these canvas roofs are presumably of the best quality of canvas, made with two ends in view: shelter and durability. Whether they are one and all good shelter and durable is a question for the individual to decide, yet those who believe them to be "good shelter and durable" must also add "as far as canvas is concerned." It is generally agreed that troops must have some form of shelter tent; of necessity we must continue to let contracts for large numbers of the least expensive, short-lived "dog tents." But are the other types and sizes, of which we have no less than a dozen, economical in any way? Many years of trial and the oft-heard expression "condemned canvas" prove canvas to be the most costly shelter we can use for sheltering our troops for periods of time when the shelter tent is deemed insufficient. How many of us have returned to the post after a summer camp and caused canvas to go before the Inspector? How many of us have done the same thing year after year? These questions answer themselves. Most of us will agree that the life of a tent is exceedingly short when in use and that storage does anything but improve it. What, then, is the solution to the problem of the economical sheltering of troops?

The argument may be advanced that our form of government does not permit billeting within its own territory and that we must perforce have shelter for our troops for more or less ex-

tended periods of time. But it is just here that our luxurious array of tentage fails to accomplish its purpose. We can billet without our own territory, should the occasion arise. We can, in the tropics, put up economical shelter, of some permanency, of bamboo and nipa. For other localities within our own borders, let us accept warehouses and similar structures, tendered gratuitously by the civil authorities or cheaply rented by the Quartermaster, or else put up light, comfortable frame buildings.

Let us consider the actual and comparative costs of canvas and lumber, and form our conclusions. To shelter a company of 100 men for purposes of computation, the following data may be safely assumed:

Canvas to Shelter Company of 100 *Men.*

14 pyramidal tents (@ $44.47)	$622.58
4 wall tents (@ $28.28)	113.12
1 paulin (@ $30.00)	30.00
Total	$765.70

Lumber to Construct Field Abode for 100 *Men.*

33,000 feet of lumber (@ $20.00 per M)	$660.00
76 four-pane window sashes (@ $.60)	45.60
Nails, hinges, locks, etc	12.40
10 doors	10.00
Total	$728.00

These figures, it will be readily admitted, are on the side of safety, in no way excessive for canvas and, in the average geographic location, liberal for lumber and building material.

Since we use soldier labor for erecting the tents (and nearly everything else), we can use the same labor to erect the proposed field abode, each company erecting under its own officers its own living accommodations, lumber and building materials to be furnished by the Quartermaster and to be delivered at the proposed site. It is always or should always be the case that each company has at least one man sufficiently skilled in carpentry to exercise general supervision over the construction and to act as foreman for the many other men who are quite good enough carpenters for the work in hand.

The building proposed and for which the above estimate is made, may be described as follows:

Building 360 feet long by 20 feet wide;
Walls 10 and 15 feet high, respectively;
Floor laid on 2x6 inch joists, which rest on cord-wood blocks or stones at desired height;
Roof with a pitch of 1 on 4, sloping to one side and made of overlapping one-inch stuff laid on 2x4s;
Windows: a single laterally sliding, 4-pane sash every ten feet on both sides and ends;
Doors, plain, one at each end, eight others distributed as desired;
Hinges, locks, latches, etc., of plain yet serviceable type;
Many interior conveniences can be constructed from scraps and surplus lumber.

Plan of building following the median line passing from one end to the other: end, partition 20 feet long dividing kitchen (20x10) from section composed of storeroom and orderly room, dining room (40x20), partition, squad room (300x20), end. The orderly room (10x10) has a door opening to the exterior of the building and one leading to the dining room. The storeroom is 10x10, and is located between the end of the building and the orderly room. It has but one door, that leading to the kitchen.

Since $37.70 is saved on each barrack from the savings on the 14 or 15 such buildings to the regiment, a building somewhat similar to the above can be erected for the officers which will not only serve as an abode but also as a headquarters and assembly hall. While the above buildings are being constructed to such a stage as to permit habitation, the prescribed shelter for the march should, of course, govern, and this would be an incentive to the rapid completion of the cantonment. For necessary heating, the many tent stoves we have on hand can be utilized by putting them on brick or concrete bases or else light air-tight stoves can be purchased at about a dollar each. The field range can be similarly mounted and excellent results obtained. Hot-water barrel attachments can be very easily made to connect with kitchen range with faucets on the outside as well as inside of building.

The wear and tear on tentage is incomparably greater than on the proposed shelter. Think of the many repairs made by the

saddler when his time should be spent otherwise. Think of the number of ropes, slides, poles, pins, grommets, skirts, hoods and flies issued to make up deficiencies in required tentage equipment within one year, if the tentage lasts that long.

The average maximum life of tentage, in the average climate, for continuous use, is something less than one year, or say four years of summer use alone. This may be considered a very liberal estimate by those quartermasters along the Mexican border who have had occasion to issue tentage far more frequently and to make constant repairs.

The case of a battery of field artillery may be cited. This battery required three complete sets of tentage during a year of windy border duty. Those of us who saw the interned Mexican prisoners and experienced the many wind and sand storms, realize the short life and utter extravagance of canvas. Windstorms and stray sparks are not nearly so destructive of wood as of canvas, while the shelter afforded by the former under all conditions of heat, cold, rain, snow, and humidity, is far superior to the latter.

In the above consideration, it will be noticed that frames, floors, doors, and other additions and improvements have been omitted from the cost of erection of the tentage, which it is obvious would be necessary for a camp or cantonment of any duration, and this materially increases the cost of the above figures for canvas by something over two hundred dollars. This amount has in many cases been spent by organizations when the Government made no such allowance and was in some cases exceeded. Officers who have served on the Mexican border know what they have spent in a vain endeavor to make "quarters" synonymous with "tents" and all because we are not fortunate enough to choose the more economical means of sheltering troops in cantonment, *i. e.*, lumber.

In the majority of summer camps, the savings resulting from the use of lumber will be enormous, for such camp sites are used from year to year and for years at a time. This applies equally to the large target ranges, camps of instruction, student camps, and target ranges at some distance from posts. In those cases where it is not desirable or anticipated that the same site may be used in the future, it should be considered that the lumber necessary for the construction above outlined has a salable value

at the end of several months use of, at the very least, 50 per cent of its original cost price.

Transportation of tentage is a large item of yearly expense, and if the freight charges from contractor to general depot, from depot to other supply depots, from supply depot to post, and then from post to maneuvers or other place of concentration be totaled, the result will no doubt be very surprising in its magnitude. The gross weight of one large pyramidal tent, crated, is 144 pounds, and with the pole, pins, tripod, and stove, we may safely say the combined weight is at least 250 pounds. For a "short haul" of 250 miles to the place of concentration, we have for a regimental allowance of tentage a very considerable item to apply on the purchase of lumber, which, as a very general rule, is at hand to be hauled by wagon to the site selected. Had the freight charges on tentage to shelter the Mexican interned prisoners at El Paso, Fort Wingate, and San Diego in 1914 been spent for lumber, it would have purchased half the lumber necessary to shelter them, thus producing a great conservation in tentage, space, upkeep, inspection, and sanitation, not to mention the increased comfort to the inmates of the camp or the improved general appearance of the stockade.

The area occupied by canvas is, of course, greater than that used for cantonment, but as space is an inexpensive item, as a rule, we need not consider this phase at length.

The floor space and cubic air allowance for the sleeping quarters of 60 square feet and 600 cubic feet, respectively, are not lost sight of but rather exceeded in the proposed abode, whereas there is a flagrant violation and consequent diminution of both whenever tents are used as the regulations require. In respect to other sanitary aspects of the problem, such as drainage, policing, presence of vermin, flies, and other insects, possibilities of disease and epidemics, ventilation, and heating, the many other advantages of the proposed lumber abode over tentage are augmented and emphasized.

However difficult it may seem to do away with our present extravagant sheltering schemes and adopt a more economical one, it can be done without legislation, argument, or trouble to anyone except the canvas maker, whose seat will then be occupied by the lumberman. If the allotment for barracks and quarters be increased and the allotments for Camp and Garrison Equipage

decreased correspondingly, we shall then have sufficient funds. The canvas can be used until exhausted or for emergency use in flooded, burned, or refugee districts. A mere order with some embellishments as to details would accomplish the scheme for field shelter. We could try it, and if it proves satisfactory to higher authorities, as well as to those who use the abodes, the scheme could be continued until something better offered.

Method of Training Troops.[1]

By 1st Lieut. A. W. Lane, 13th Infantry.

THE present general interest in the subject of national defense will doubtless result in the reorganization of the land forces of the United States. The character of the new organization is likely to be determined largely by the popular demand for rapidity in training. Plans based on such a demand will not effect the best possible results, but they do impose upon the Army the duty of developing methods of training which will be efficient though intensive. This appears to be the primary idea in the subject proposed for the Infantry Prize Competition.

The subject may be interpreted to mean that the service of the future reservist is to be in the Regular Army under the same conditions as now exist, except that active service is to be for two years instead of four; or that it is to be in a new force whose sole function is the training of reservists. It is obvious that exactly the same training methods would not apply in both cases, for in the latter, provision must be made only for individual instruction and collective practice, while in the former, provision must also be made for training in the "Tactical Handling of Troops," *i. e.*, for training in leadership and direction. In either case, the part of special importance, so far as the reservist is concerned, is individual instruction and collective practice; consequently, in this essay we shall not consider the tactical handling of troops except in connection with the allotment of time to the various phases of training.

As a basis for the discussion of our subject as thus limited, we shall use Official Bulletins Nos. 2 and 4, 1914, which publish in tentative form a proposed Manual of Training. We shall try to adapt the basic principles of this manual to the requirements of the infantry soldier undergoing intensive training.

OBJECT AND NATURE OF MILITARY TRAINING.

A clear understanding of the object and nature of military training is essential to any intelligent discussion of the methods to be employed.

[1]Awarded honorable mention in competition for Infantry Prize Essay under the title "Method of training troops so as to graduate trained men into the Army Reserve after two years' service with the colors."

"The immediate purpose of all training is the development of an efficient fighting machine and of skill in handling it. Its ultimate object is success in war." "Without discipline troops can neither be trained nor their powers fully realized. *Discipline* is, therefore, the foundation stone of military efficiency." "The moral training of a soldier underlies all other factors in his training, for the reason that no amount of skill can compensate for the absence of morale."

The *training* of the infantry soldier, as distinguished from his *discipline* and *tactical handling*, includes the following:

I. Technical training.

(*a*) Individual.

1. Use of weapon.
2. Use of equipment.
3. Development of physique and marching power.
4. Special technique of the infantry soldier as described in the Drill Regulations.
5. For individual specialists: topographical sketching, signaling, messenger duty, first aid, etc.

(*b*) Collective.

1. Infantry technique, *i. e.*, the ability to deliver upon a designated target a heavy rapid and accurate volume of rifle fire, to entrench, and to deliver *en masse* an effective bayonet assault or counter-assault.

II. Economic training:

(*a*) Personal.

1. Care of person, including hygiene and individual cooking.
2. Care of equipment.

DISCIPLINE AND MORALE.

Since discipline and morale are closely related and together are the vital elements of fighting power to which all others are subservient, it follows that the best methods of moral training should be a subject of the greatest interest to all officers. But incredible as it may seem, it is nevertheless true that in practice discipline

and morale as subjects for training are generally ignored. This condition is probably the greatest defect in our present training methods and is doubtless due to the fact that the average officer agrees that "good military discipline is acquired only in the course of time and under the influence of a military environment," but fails to realize that "the moral element . . . will be developed by peace-time training in proportion as it is given special consideration." Blinded by the idea of the paramount importance of "time" and "the influence of a military environment," he fails to see that this environment derives its influence primarily from his own character, knowledge, and attitude toward discipline. He fails to see that if he gives special consideration to the acquirement of exact knowledge of disciplinary principles and the best methods of imparting this knowledge to his subordinates, he may be able to avoid absolute dependence on the influence of environment and to decrease the time required for disciplinary training by directly instilling sentiments and inculcating opinions that are favorable to discipline.

Hence we conclude that in disciplinary as well as technical training, the first and most important step is to educate the officer. Accordingly, we shall give some special consideration to the principles of discipline and disciplinary training which we believe should form the basis for the education of the officer as well as the subsequent training of the soldier.

Principles of Disciplinary Training.

Nature of discipline and morale.—These are essentially mental attitudes or conditions. Mental characteristics that have a direct bearing on the battle efficiency of the soldier are—

Class 1: those which are firmly fixed by heredity or early environment and education, *e. g.*, natural bravery or cowardice.

Class 2: those which can be developed by direct instruction and training, *e. g.*, patriotism, sense of duty, respect for and obedience to authority.

Class 3: those which cannot be developed directly but which are the indirect result of a military environment and training, *e. g.*, confidence in leaders, comrades, and self.

Disciplinary training cannot develop Class 1 but may be able to apply desirable characteristics to distinctly military ends. Class

3 includes the factors of military efficiency which will be lacking in proportion as training is made intensive. Class 2 includes the characteristics which are the immediate object of direct disciplinary training, *i. e.*, those which are not so firmly fixed as to preclude the possibility of development or elimination.

Objects of Moral and Disciplinary Training.

1. To instil and develop in the soldier's mind thoughts and mental characteristics of sufficient power to enable him to control the emotions aroused by battle;
2. To eliminate as much as possible mental characteristics that detract from the spirit of self-sacrifice and the determination to win success, *e. g.*, fear, vacillation, and excitability;
3. To make discipline a reliable force by teaching the soldier its nature, convincing him of its necessity, and inculcating the determination to sacrifice himself, if necessary, for its attainment;
4. To develop a genuine respect for, confidence in, and obedience to authority;
5. To picture clearly in time of peace the realities of war, lest the shock of discovery in time of war should be so intense as to overpower the soldier's determination to yield to discipline.

Method of Disciplinary Training.

1. Teaching the necessity for and nature of discipline.

   First, make the officer comprehend the subject.

   Next, appeal to the intelligence of the soldier by a clear statement of the subject with examples drawn not only from military history but also from such well-known instances as railroad organization, foot-ball teams, and the like.

   Make instruction brief but repeated frequently throughout the soldier's entire service.

   Be consistent and make practice accord with instruction, *e. g.*, never tolerate a breach of discipline lest this tolerance detract from the force of instruction as to the vital nature of discipline.

   Make use of actual breaches of discipline to emphasize the point that such offenses, if generally committed, would destroy the efficiency of the army.

2. Inculcating the spirit of self-sacrifice.

If patriotism, a strong sense of duty, or even the primitive instinct of home defense pervades the nation and inspires the people, no special effort will be required to inculcate the spirit of self-sacrifice in the soldier, but he must be convinced that he can best apply this spirit to the accomplishment of his desires by yielding to discipline. On the other hand, if the soldier is deficient in patriotic feelings, the officer, like the statesman, must try to arouse the desired spirit by appeals not only to the soldier's reason but also to his passions, prejudices, hopes, fears, etc. To accomplish this end is difficult but not impossible if the officer is conscientious, persevering, and a careful student of human nature.

3. Developing respect for, confidence in, and obedience to authority.

Respect engenders confidence; together these qualities will make obedience reliable because willing.

To develop respect for authority:

(*a*) Show its extreme importance to military efficiency;

(*b*) Be exactly just and tactful in its use, *e. g.*, be firm, strict, and impartial in the dispensation of justice—recognize rights—scrupulously avoid unnecessarily burdensome exactions, trifling, and petulance—be inflexibly severe toward disobedience and insubordination, but otherwise be lenient whenever possible;

(*c*) Cultivate those personal qualities and characteristics which command the respect, loyalty, admiration, and affection of other men, *e. g.*, courage, boldness, fortitude, professional skill, fertility of resources, strength of will, justness without favor and without fear, energy, enthusiasm, promptness of action, sincerity, earnestness, conscientiousness, patience, urbanity, kindness, sympathy and regard for the welfare of subordinates, without cant, hypocrisy, or sentimentalism.

4. Picturing the realities of war.

Forewarned is forearmed; hence to guard against the effect of fear, surprise, or other emotions destructive of discipline:

(*a*) Accustom the soldier to the thought of ordinary battle incidents such as the sound of bullets, the burst of shrapnel, men being killed and wounded, and the nerve-strain caused by the "void of the modern battlefield."

(*b*) When he understands thoroughly the probable dangers and difficulties of battle as well as his duties, strengthen his determination to perform these duties faithfully, to advance in the face of danger, and to overcome all difficulties by—

1. Pointing out the compensating features of battle incidents, *e. g.*, small number of hits compared with the number of shots fired and heard; artillery ranging difficulties; the fears of the enemy equal to or greater than his own; the efficiency of his own troops;

2. Directing his thoughts to his own particular rôle in battle, to his own courage, patriotism, and sense of duty, and inducing him to ask himself repeatedly if he is prepared to face the ordeal of battle as a true and brave man;

3. Showing clearly that the disintegrating effect of battle tends to destroy tactical cohesion and hence requires of the soldier not only obedience but also initiative, self-reliance, and boldness. Emphasize these points by frequent exercises in provisional organizations with disordered units and large simulated losses. Teach the soldier: (*a*) to follow and obey willingly any officer or noncommissioned officer; (*b*) to execute the orders that he receives with intelligence and without slavish reliance on regulations or detailed instructions; (*c*) in the absence of orders and leaders, not to "let things slide" but to "do any intelligent thing consistent with aggressive execution of the general plan" so far as it is known;

4. Representing, as nearly as possible, in every field exercise, conditions as they might appear in real action.

TECHNICAL TRAINING.

The methods of technical training that we advocate are based on these principles:

The object of training is to insure success in battle through efficient teamwork;

Teamwork can be developed only by thorough and uniform training of individuals and minor units;

To insure uniformity of training, its various steps must be standardized, *i. e.*, we must determine—

1. How many working hours are required for each training process and how many for the entire process;

2. The best program of work;

3. The most efficient teaching methods (which should be published officially as guide);

4. A system of testing the progress of those undergoing training;

The first and most important step in standardizing training is to maintain (in practice as well as theory) a sharp distinction between individual and collective training;

Individual training will be most efficient and its effect most lasting when it appeals to the intelligence of the soldier in such a way as to give him a practical knowledge of the *principles* of the regulations;

Training methods are good only when they prepare troops for their duties in war and insure that what is learned in peace need not be rejected in battle.

Recruit Training.

Applying the foregoing principles to the subject of recruit training, we conclude—

That recruit and individual training should be considered as synonymous; hence, before the recruit is permitted to join the ranks of his company, he should receive all the individual training that is an essential preliminary to real collective instruction and practice;

That since the existing recruit depots do not have the facilities for such comprehensive training, they should be discontinued

(except as distributing points), and recruits sent directly to their regiments;

That assignment of recruits should be made annually or at most semi-annually;

That before recruits are assigned to companies, they should be trained for six months under officers and noncommissioned officers selected from the entire regiment on account of special fitness for this most important duty;

That the program of work during this first six months should be approximately as indicated in Column D of the following Syllabus of Recruit Training, in which is included for comparison:

The English peace-time, 12-week course. (Column A.)

The English war-time, 10-week course. (Column B.)

The United States 36 drill-day course as given at the Recruit Depot at Fort Slocum. (Column C.)

Syllabus of Recruit Training.	A	B	C	D
I. Individual Technical Training.				
1. Use of weapon.				
Small arms firing (including visual training)	52	78	7.5	95
Bayonet Combat	...	7	...	20
2. Use of equipment.				
Entrenching	...	8	...	30
3. Development of physique and marching power.				
Physical Training	60	59.5	41.5	62
Marching	5	27	...	30
4. Special technique of the infantry soldier as described in Drill Regulations.				
Drill				
(*a*) Squad without arms	56	12	5.5	12
(*b*) Squad with arms	25	38	26	50
(*c*) Extended Order	28	42	...	47
(*d*) Combination of a, b, c	..	42	...	..

(*e*) Platoon (squads combined)....	...	4	5	15
Outposts.....	...	16	...	30
Night Operations.....	10	19	...	30
Guard Duty.....	4	...	12.5	16
Tent Pitching.....	...	...	3	10
Ceremonies.....	...	...	Varied	30
II. Personal Economic Training.				
Care of person and equipment, including first aid, hygiene, individual cooking, description and care of rifle, fitting marching order	...	7.3	9.5 36	22
III. Lectures.				
Subjects such as Discipline and Military Courtesy, Organization and Customs of the service, Tactics, Rôle of Infantry, Spirit of the Offensive, National History, etc.....	26	60	3.5	26
Total.....	266	420	150	525

Notes on proposed syllabus (*Column D above*).

The total number of working hours required (525) has been determined—

1. By a careful analysis of the actual work of six infantry companies during a period of one year;

2. By observation of the work at a recruit depot, which convinced us that the time allotted for depot training (150 hours) is insufficient to teach thoroughly even the comparatively few subjects prescribed;

3. By the report that the English are finding their war-time course of training (420 hours) too short.

It is contemplated that recruit training will require 140 days of 3¾ working hours each. Experience shows that in six months no more than 140 drill days can be expected, deducting Sundays, holidays, fatigue days, etc., but including Saturdays; also that no more than 3¾ working hours can be counted on if drills are made

short and frequent and cease at noon; *e.g.*, the daily schedule might be: (1) 6:45 to 7:15; (2) 7:30 to 8:00; (3) 8:15 to 8:45; (4) 9:00 to 9:30; (5) 9:45 to 10:15; (6) 10:30 to 11:45; total, 3¾ hours.

The allotment of time to the various subjects of training permits the schedule just given to be used as follows:

Period	*Exercise*	*No. of Days*
1st (½ hr.)	Close-order drill by squad	124
2d do.	Physical Training	124
3d do.	Personal Economic Training	44
	Tent Pitching	20
	Ceremonies	60
4th do.	Extended-order drill by squad	94
	Platoon drill (after 3d month)	30
5th do.	Guard Duty (Instruction)	32
	Bayonet Combat	40
	Lectures (1 per week)	52
6th (1¼ hrs.)	Small Arms Firing	76
	Entrenching	24
	Outposts	24
	Marching (no other instruction)	8
	Night Operations (no other instruction)	8

Recruits should be grouped in squads of 8 men and throughout the recruit course should remain under the immediate charge of the same noncommissioned officer. These squads or classes should be instructed by their own squadleaders in general subjects such as close and extended order drill, but instruction in subjects such as Small Arms Firing and Bayonet Combat should be the duty of highly trained specialists.

"In order that all may advance as rapidly as their abilities permit, the recruits are grouped according to proficiency as instruction progresses." (Par. 49, I. D. R.) This principle is commonly ignored, but its importance cannot be too strongly emphasized. By this means only it is possible to avoid repetition of drill in mastered subjects, which wastes time, kills interest, and stifles ambition. It does not matter if this proficiency grouping causes a man to graduate from the recruit course in less than

six months or requires him to take it for a longer period, but it is a matter of the greatest importance that no man should join his company and receive collective instruction before he is thoroughly grounded in the individual work covered by the recruit course.

It is desirable, but doubtless not practicable with a system of voluntary enlistment, that all recruits should join their companies at the beginning of the outdoor or field-training season. In any case, the evil of having recruits join at odd seasons and irregular intervals will be minimized by a strict adherence to the principle of thorough individual training during the recruit period.

Climate conditions may necessitate departures from the course we recommend, but its essential features can be carried out under any conditions, provided the art of indoor instruction is mastered. This subject will be considered later.

Physical training is intended to consist principally of calisthenics, rifle drill, and other exercises which are done at word of command with great attention to exactness of execution and perfection in the simple exercises before progressing to the more difficult, and which, as a result, have considerable disciplinary value. Conformity to an established minimum and not individual preëminence should be the object of all athletic training. Voluntary athletic games for recreation in the afternoon should be encouraged.

Training within the regiment and higher units.

Amplifying Par. 106, Vol. I, Official Bulletin No. 2, we find that training periods in the United States may reasonably be allotted as follows:

First Term	Jan.	Company Garrison Training	(Indoor)
	Feb.	do do do	do
	Mar.	3 weeks; Company Garrison Training	(Outdoor)
		Remainder; Battalion Garrison Training	do
	Apr.	Company Field Training	do
	May	do do do	do
	June	Battalion Field Training	do
Second Term	July	Target Practice	do
	Aug.	2½ weeks; Regimental Training	do
		1 week; Brigade Training	do
		1 week; Division Training	do
	Sept.	Maneuvers	do
	Oct.	3 weeks; Company Field Training	do
		Remainder; Battalion Field Training	do
	Nov.	Company Garrison Training	(Indoor and
	Dec.	" " "	Outdoor)

Company Garrison Training.

This training, like recruit training, must be distinctly individual. Its primary object should be to develop the intellectual faculties of the soldier as well as the physical, to train his memory, to accustom him to listen, reflect, and understand, and to make him capable and willing to act independently. To accomplish this end, the company commander must—

1. Study and determine accurately individual needs;

2. Provide for needed individual instruction by dividing his company into small sections or classes each under the best qualified instructor available;

3. Scrupulously avoid the tendency to confuse individual and collective instruction, *e.g.*, never waste time during company drill in correcting errors in the School of the Soldier and the School of the Squad. If the men are properly trained and are attentive, such corrections will not be necessary; if they are not so trained, there is no excuse for advancing them to the School of the Company, and squad drills should be resumed; if the men are sufficiently trained but are inattentive, this squad drill should be made extra drill.

4. As soon as each man demonstrates that he has mastered the subjects in the recruit training course, keep up his interest by giving him an opportunity to increase his individual resourcefulness and self-reliance by extending the small-class system to include instruction in subjects such as camp expedients, lashings, and field engineering, packing, scout-craft, etc. If a man shows aptitude, give him an opportunity to qualify as a specialist in signaling, sketching, or as an instructor in small-arms firing, bayonet fighting, and the like.

5. When the men are proficient individually and climatic conditions permit, train the company collectively in the School of the Company with particular attention to Fire Discipline, Control, and Direction.

Company Field Training.

Collective training is the prime object of field training. The individual instruction of the garrison training period should include all items that are elementary and of universal application, most of which can be demonstrated on the ground in a few

minutes; collective training should include all details that require constant repetition on different types of ground.

The principal divisions of field training are: (1) for attack; (2) for defense; (3) for security. It is desirable to allot distinct days to each of these branches so that the soldier can spend the entire day with a few general principles in his mind and learn to apply them in different situations and on different ground. For this purpose, an excellent program has been suggested by General Haking in his valuable work on "Company Training." So effective is this program (as proved by actual test) that we quote its principal features as a model.

Program of Field Training (after Haking).

Day.	*Exercise.*
1st	Advance through zone of artillery fire.
2d, 3d, 4th	Advance through zone of infantry fire before fire superiority has been gained.
5th, 6th	Gaining fire superiority—the advance to the assault—the final assault.
7th	The attack complete. Night exercise (lasting all night): outpost duty (outguards, supports, and patrols).
8th	Rest, except for lecture or critique.
9th	Reconnaissance and selection of various defensive positions, with actual construction of trenches if possible.
10th	Defensive work: clearing the foreground, siting and constructing obstacles, range marks; assignment of sectors for distribution of fire, actual defense of position including a counter-attack.
11th	Service of Security: outposts by day, including selection of outguard positions, training of sentinels in observation, defensive arrangements of supports, trenches, obstacles, lines of retreat, patroling.
12th	Outpost duty with company performing exactly its normal functions. Various positions to be occupied and compared. Positions occupied all night with frequent patrols under competent instructors.

13th	Rest.
14th	Advance-guard work: particular attention to rapid deployment and immediate attack on small localities, with skeleton troops resisting.
15th	Advance-guard work: particular attention to action of reserve companies moving to assistance of support (*i.e.*, occupation of important positions to flanks as well as to front).
16th	Rear-guard work: deployment on extended front and retirement by echelon—note cooperation of artillery and action of cavalry.
17th	Outpost duty (late p. m. and night): emphasize action when adjacent support has been driven back and own support is subject to a heavy attack; also occupation (at night) of a position which has not been reconnoitered previously.
Subsequently.	Bridging, etc. Then return to the attack, practising the various forms on all types of ground. Especial attention to night attacks.

It is to be noted that this program includes nothing but collective training and presupposes that all the members of the company are thoroughly trained in individual work. However, we have found it advisable to modify this program to the extent of having garrison training one day per week throughout the field-training period.

Target Practice.

The month allotted to target practice during the field-training period is extended to cover individual known distance practice and collective combat practice as described in the Small Arms Firing Manual. This period will be too short unless care is taken that range practice is merely the application of fundamental principles of marksmanship which have been thoroughly taught during recruit and garrison training by preliminary drills, gallery practice, and (in the case of recruits) by Special Course A. Nothing should be left for range instruction which can be taught in advance. Preliminary instruction is efficient and adequate only when it eliminates entirely the necessity for instruction on the range in details such as deflection and elevation, correction, aiming, aiming positions, trigger-pressing, holding, and estimating distance.

The moral effect of target practice must not be overlooked in the effort to make the soldier a practiced marksman. Battle morale and fire discipline can be increased by developing in the soldier confidence in his own ability to make hits and in the ability of his officers to control collective fire and direct it to the best advantage. To insure this, confidence, quite as much as individual skill, should be the object of range practice.

Since the entire suspension of drills during the target season tends to sloppiness and relaxation of discipline, it is advisable that the soldier attend drill when he is not needed on the range.

THE ART OF INSTRUCTION.

Faith in the intelligence of the soldier is the keynote of successful instruction. The failure of the soldier to learn will be due to the stupidity of the instructor or lack of individual attention. No peculiar methods of instruction are required. As ever, theory must indicate clearly the purpose and object of an operation as well as the means for its attainment, while practice must afford the opportunity for applying theoretical principles to concrete cases, thereby developing initiative and professional skill.

The indoor period is obviously the time for theoretical instruction, which should never be given during the outdoor period except to refresh the men's minds as to principles they have previously learned and are to apply immediately to a particular situation or exercise. The usual waste of time during the indoor period is a serious reflection on our present methods and requires special consideration in any study of intensive training.

Indoor Instruction.

Indoor instruction can be greatly improved by more attention to

1. *Theory* by lectures;
2. *Illustration* by the use of the sand-table and blackboard;
3. *Application* by the extension of the applicatory system of instruction by means of map problems, map maneuvers, etc., to include the instruction of privates as well as officers and noncommissioned officers. Here again the small-section grouping is essential.

Lectures (after Haking).

It is generally thought that the average soldier cannot be interested by lectures that the average officer is capable of delivering but the fallacy of this theory can be easily established by actual test. It requires no oratorical ability to interest the soldier in a discussion of the basic principles of his work and training. All that is necessary for a profitable lecture is—

1. Careful preparation and sufficient accurate knowledge of his subject on the part of the lecturer;
2. Logical sequence in the arrangement of ideas;
3. Terse statement of facts;
4. Lecture spoken and not read;
5. Attention of the audience fixed throughout.

A simple but effective way of meeting these requirements is the "Question and Answer Method," which is outlined as follows:

Explain the situation and prepare the minds of the audience to understand what the subject is about.

Make the questions and answers definite and short, leading from a perfectly intelligible general situation to the particular situation or subject that is to be discussed. Make each detail follow in logical sequence from what precedes. Strive for unity and coherence. Summarize the important points in conclusion in order to make a lasting impression.

This method is of general application. Commence each case with the object of the particular operation it is intended to teach and continue with the details arranged in logical sequence. What are we aiming at? What is the first step? Why? Why not do something else? Is the action recommended of universal application or does it depend on the ground and the situation? If so, give types of ground and types of situations which are most commonly met with in war. Never leave a question with a vague solution; always find an answer which will at least suit one type of ground or one type of situation. Never avoid a question; if it occurs to the lecturer, it will occur to his audience; if he cannot find the answer himself, he must ask someone else. Some questions are very difficult to answer, but careful thought and division of the question into several parts will usually produce a satisfactory reply.

The Sand-table and Blackboard.

The value of a lecture is greatly increased if it is possible to illustrate the principles taught. In many cases, the sand-table and blackboard answer this purpose. Damp sand can readily be modeled to show all varieties of terrain; hence, the sand-table is always useful when the lecture includes any discussion of the tactical use of ground. For the same reason, the sand-table can be used in connection with the applicatory system as a substitute for a map or even for the actual ground when the most suitable type is not accessible. With a little ingenuity and improvising of accessories, the sand-table can also be used to represent all kinds of entrenchments. Its use in teaching map-reading and map-making is obvious.

The Applicatory System.

The value of the applicatory system in company training is due to modern battle conditions, which make it necessary that the soldier as well as the officer shall be able to think and act for himself, and have initiative and decision of character. If the applicatory system is particularly suited to the needs of the officer in this respect, it can and should be adapted to the needs of the soldier.

Outdoor Instruction (after Haking).

Keynote: combination of demonstration and verbal instruction.

Demonstration.

The theoretical part of the work having been explained by lecture, proceed immediately to the ground and make a practical application of the principles taught. Generally, part of the company watches while the other part executes. The instructor points out what is wrong, why it is wrong, and what should have been done. Resort should be had to competition to maintain interest and emphasize mistakes.

Effect of varying ground and the immediate situation.

Realization of the disturbing influence of ever-varying ground and the immediate situation is highly important. There is some limit to the variation in situations but none to the variation in the ground. Never forget that all operations (whether of attack, defense, or security) vary constantly during the operation not only

according to the ground but also according to the immediate situation. For example, the leading troops of an advance guard attack quite differently from those engaged in a general attack against an intrenched position. Varying ground requires varying action and hence varying instruction.

Type Situations and Type Ground.

These can be used to indicate reasonable action if the men are taught to use their common sense. As to variations from typeforms, greatest stress should be put on variations of the ground (which come first), variation of the situation as regards any particular operation (coming second) and variations as regards tactics, viz., attack, defense, and the service of security (coming third).

Method of Application.

Do not let the scheme of instruction be merely tactical and with the idea of teaching some general subject such as the attack, the defense, etc. Instead start with the idea of teaching the men how the variations of the ground and situation affect their action in the attack, how they affect them in the defense, and how in the service of security. Teach one subject thoroughly before proceeding to another (*e.g.*, the attack complete before the defense) in order to avoid confusion.

Steps in Demonstration.

(1) Thorough reconnaissance of ground by company commander previous to the exercise; (2) detail of men (with blank cartridges or targets to indicate fire action) to outline the hostile position; (3) clear statement both of the general and the special situation to the entire company; (4) summary of main points of previous theoretical instruction as an aid to memory and a clear understanding of the object of the exercise; (5) execution of the exercise by a part of the company with remainder as observers; (6) detailed criticism by the company commander followed by movement of the entire company over the same ground according to the principles of a tactical walk; (7) repetition of the exercise by the other subdivisions of the company or (in an extended exercise by another subdivision; (8) attention to psychological principles in so far as they affect the choice of positions; also regard for possible artillery cooperation; (9) same exercise over different

ground always with particular care to the selection of fire positions; (10) in the selection of sectors of a defensive line and in the study of suitable clearings and obstacles, subdivisions may work simultaneously, later observing the work of other subdivisions under the guidance of the company commander; (11) same principle applies in occupying outpost positions; the company commander selects general positions (giving reasons for selection) but requires subordinates to work out details.

This laborious method is required only for instruction purposes; after principles are thoroughly understood, much of the above may be omitted, but there should be frequent opportunities for the application of the knowledge thus gained to varying situations.

Do not strain the soldier's imagination; an imaginary enemy is always objectionable. Whenever possible, arrange with other companies for opposition by actual or outlined troops of unknown strength. The use of skeleton troops from one's own company is always possible and adds much to the value of a combat exercise.

CONCLUSION.

A most casual reading of this essay will show that it contains few original ideas; it is, in fact, a collection of what we believe to be good ideas from sources so numerous that it has not been practicable to give credit where credit is due. We have purposely avoided advocating principles and methods that are likely to excite controversy, because no successful system of training can be based on principles that are questioned by the majority of officers responsible for the execution of the details of that system. We have merely tried to devise a well balanced plan based on a correct estimate of the true relation of recognized principles, and to emphasize such of these principles as are commonly slighted.

Careful study leads inevitably to the conclusion that all attempts at intensive training will fail unless a comprehensive system is developed and made standard by War Department authority. The proposed Manual of Training is a long step in the right direction, but it leaves details of execution "to the initiative and judgment of those charged with the responsibility for training." As a general proposition, this principle is correct but applied to the problem of intensive training, it fails for the simple reason that as a result of the conditions heretofore existing, few officers have had any experience with intensive training,

and consequently, few are qualified to arrive at a proper decision as to detailed methods of training in which time is an important factor. It is obvious that if officers are not guided in their choice of methods, there will be many different solutions of the problem. Some of these solutions will doubtless be excellent, but still more are likely to be inferior, for if a problem admits of several correct solutions, it also admits of some decidely incorrect ones, and the number of the latter type will increase as conditions are unfamiliar and the regulations silent as to proper procedure.

What is needed, then, is to insure uniform procedure by issuing an official "Guide to detailed training" for the benefit of the training staff and older officers as well as for the younger. This guide should indicate exactly what is to be taught, how it is to be taught, how long the teaching should take, and how progress is to be tested. Its provisions should not be prescribed as hard and fast rules but merely as good and practical methods which individual judgment can utilize and develop with experience.

The next step is to make certain that the principles of this guide will be applied. This will never be done in the proper spirit until the majority of officers are convinced of the intrinsic merits of the guide and of the necessity for the strenuous, intelligent, and persistent work which it is certain to require of them. This conviction can only result from a strong sense of duty and personal responsibility joined to a conception of the Regular Army as an agency for nationalizing defense rather than as a means of defense.

So we conclude with the axiomatic proposition: Successful training of men who are to pass into the army reserve after two years' service with the colors depends primarily on the character, judgment, and professional attainments of those who are responsible for this training. Methods are only a means to an end and will accomplish nothing unless the average officer has the will-to-do.

Armory Instruction in Minor Tactics.

By Capt. Herbert W. Congdon, National Guard, N. Y.

AN ARTICLE in a recent issue of the INFANTRY JOURNAL emphasized the value of tactical walks for teaching principles of minor tactics. Probably no other method is as efficient because it awakens and holds the interest of the students and combines instruction with pleasure.

Unfortunately, it is not applicable to the winter or post instruction period of many city militia organizations to the extent that is desirable. Tactical walks at night have a very limited value; and it is by no means easy to secure attendance of officers or men on Sundays, while the limited amount of winter daylight after business hours on Saturday afternoons is apt to be consumed in transit to the place of instruction. Men who willingly sacrifice their evenings to military work are loath to give up their holidays, and a company commander hesitates to order school work at times that detract from the carefully fostered enthusiasm for higher military education. One or two tactical walks outdoors during a drill season are about all that seem desirable in such cases.

Nevertheless, this instruction should not be left for the summer camps. Primary instruction should be given during the winter drill season. Therefore, recourse is had to the sand table and to map problems as adjuncts to instruction on the drill floor. Map problems are dry and uninteresting to many minds, owing to a failure to use the requisite amount of imagination. Solutions are apt to be perfunctory, unimaginative, and disappointing to the instructor, and the sessions of the school far from a popular feature of the drill season. The problem, then, is to devise a means of bringing the tactical walk, with all its interest and enthusiasm, into the class room, by means of the camera and the stereopticon. My solution of this problem has been in use for several months now, and while the development of the possibilities of the scheme is by no means complete, I have tested it out far enough to be sure that it works; that while it is less effective than a real tactical walk outdoors, it nevertheless interests and stimulates even the least enthusiastic corporal, and has had a highly

beneficial effect in disseminating information among the non-commissioned officers and ambitious privates who are in the school. I find that men do not mind giving an extra hour before or after drill to school work, who consider an extra night at the armory an inconvenience and the loss of a Sunday a disaster; and that they are interested in perfecting themselves in their duties as never before.

My methods is to make a lantern slide of a military or topographical map, and laying out a series of problems on this map, to make photographs of all points involved and important views from these points. From a skilful laying out of the problems, a great many different combinations may be worked of these views, and it is surprising how much can be accomplished with the expenditure of only two or three rolls of film in the ordinary pocket Kodak. New York City troops are fortunate in having an excellent military map of Van Cortlandt Park prepared by the 22d Corps of Engineers, N. G. N. Y., terrain with which the men are familiarized through tactical walks; but for instruction in map reading, I also use the U. S. Geological Survey maps of a strongly marked mountain country, illustrated by a dozen landscape slides made from negatives that were taken long before I had thought of the camera as having any value save for souvenirs of pleasant week-ends.

The first school is given up to instruction in map reading; the slide of the map is shown on the screen and the theory of scales, contour lines, and cultivation signs thoroughly explained. This is made easy by taking definite points on the map and showing them in the landscape slides. The students are asked to consider the possible view from a certain position, attention is called to the contour lines and physical characteristics; then the corresponding landscape slide is shown, and attention called to the shape of the hills in the background, the location and visibility of landmarks, and other features. The map slide is again shown and checked up, attention being called to the convexity or concavity of hills as shown in the landscape slide and indicated by the contours. In this way, a very considerable degree of ability in map interpretation is attained in a surprisingly short time. There is a wealth of material for this sort of instruction to be had by anyone motoring through hilly country, and it is easy to obtain post-card views which, with the Geological Survey maps, may be used direct

in a Balopticon, as I shall explain later, without the necessity of having the more costly lantern slides.

As soon as the men are sufficiently familiar with map reading to make it possible (and this is often accomplished in a single session of the school), we proceed to simple patrolling problems. If the average militia corporal is sent out on a reconnaissance, not only is he as a rule poorly fitted to instruct his men in their duties, but frequently he is ignorant of them himself. Therefore, it seems wise to concentrate attention on instruction in the duties of patrols under various conditions and on various missions.

A school of this sort is conducted exactly like a tactical walk. The general and special situations are explained with the aid of the map slide just as would be done in the field but with the added advantage that everyone can see the map perfectly and at the same time. Moreover, I find that a lantern slide is easily visible in a room that has not been fully darkened, but is sufficiently lighted so that the students may write their notes during this explanation. I also find that a lantern slide shows up almost as distinctly on a blackboard as it does on the usual white screen. This is of great importance, for it permits drawing with white or colored chalks on a large scale map in view of all without in any way injuring the map itself, which is a lantern-slide. Wooden dividers are on the market, having a set-screw, which permits scaling distances from the scale projected on the board as a part of the map.

The situation explained, the men are oriented; they are told, "You are here on the map, and looking to your left you see this . . . (the landscape slide following with the view, which is thoroughly discussed). In front of you, you see this . . . (another slide);" and similarly for the right, the map slide being shown between each and checked up, so as to avoid any confusion. Locations of our own patrols or outguards are pointed out, and if the blackboard is being used, may be drawn on the projected map, becoming practically invisible on the following landscape slides, but as the map slide is shown between all landscape slides, constituting a record of each stage of the event.

The patrol is then moved forward on the map to the point where the first Special Situation is to be developed. Here the new view is pointed out. "Having reached this point (showing it on the map) your left flanker sees this view . . . (following with the landscape slide). At the edge of these woods (pointing) he sees

an enemy group of four mounted men just emerging . . . etc. What are you going to do?"

The full light is then turned on, the slide still remaining visible, and a certain time allowed for a written solution; or a verbal discussion is held, just as in a tactical walk. The successive situations are taken up, and in this manner the problem is worked to its end. The papers are then signed for identification, actual messages on regulation message blanks being included when the solution of the situation seems to require it; and after these are marked and criticised, they are returned to their authors so that they may receive them within a day or two while the problem is still fresh in mind. This generally leads to an informal discussion on the ensuing headquarters night, which with us comes midway between drill nights.

Usually one man is detailed to represent the actual leader of the unit concerned. After all have written their solutions of the situation, he gives the necessary instructions or orders to the others who represent the men of his command. This tends to provoke discussion and helpful criticism, and helps to develop an ability to give clear and concise instructions or information.

In addition to the tactical instruction, every session conveys incidental instruction in map reading, so that the newer members of the class do not delay the others who have already learned to comprehend their maps. Variations of the method may be devised to test the powers of observation in different ways. It is not difficult to arrange slides which are in effect "close-up" views of the terrain supposed to be seen by an individual, as if field glasses were used: pictures of patrols, firing-lines, camps, etc. These aid in training the students to see all that is in the picture and to interpret its significance better than by the unaided imagination.

The lantern slide excels for the projection of material on the screen, but it is not essential, for there are a number of inexpensive lanterns on the market that will project, by reflection, opaque matter like picture post-cards and maps. A ten-dollar model is operated either by an incandescent electric lamp or by a Welsbach gas burner and serves admirably for a small group where the lantern can be within a few feet of the screen. For larger classes, where it is necessary to project twenty feet or more, a more costly apparatus with arc light is required. For about $50, a combined apparatus of this sort can be obtained, which may be used either for lantern

slides or for opaque projection of anything up to the size of a post-card; and for a small additional sum, an attachment may be purchased with which lantern slides can be made by enlargement or reduction from negatives that are not of the right size for making contact printed slides; for about $25 or less, a simple stereopticon is to be had which uses lantern slides only.

Contrary to the usual opinion, lantern slides are easy to make; when made by an amateur, they cost only about seventy cents per dozen for materials and chemicals; but when made by a professional, the usual price is fifty cents each. They are practically Velox prints made on a glass base instead of on paper. Most of them are so sensitive that before completion, they have to be handled in ruby light like any photographic plate; but two brands are made that can be handled the same as Velox and printed by gas light in the same manner, provided that the original negative is of the correct size.

Illustrations for opaque projection must be flat and very definite; prints made on glossy post-cards are the best In making the original pictures, it is wise to use a camera that uses plates or films approximating the post-card size. Possibly three and one-quarter by four and one-quarter inches is as good an all-round size as any. A camera of this sort will cost from $2 to $75 according to the lens and shutter equipment. With all but the costly cameras, it is best to make the original pictures by time exposure, using a tripod and stopping the lens down with a small diaphragm or stop, as this gives a maximum definition. Even second-rate snap-shots will give lantern slides of considerable use, but for opaque projection clear and definite prints are important.

Tactical walks are undeniably the best means of instruction in minor tactics, but for the many times that a tactical walk is impracticable, the method of instruction outlined above will prove superior to the ordinary map problem by aiding the imagination, elucidating the map, and most important of all, stimulating the interest of the students. I believe that use will prove its worth and suggest modification and betterment. Cooperation between companies and neighboring regiments will avoid the needless duplication of bulky and expensive lantern slides through a system of exchange; and in this connection, it is worthy of note that one set of slides may be used in preparing a number of problems for each of the arms of the service.

Power Traction in War.[1]

By the Right Hon. Sir John Macdonald, K.C.B.

EIGHT years ago, I was allowed to read a paper in the theatre of the Royal United Service Institution on "The Organization of Power Traction on Roads for National Defence." The military authorities had up to that time been slow to attach serious importance to the explosion engine vehicle for military purposes. And for some years after that the awakening to importance was a very slow process. Something was done to insure the availability of goods-carrying wagons by a system of subsidies, but nothing was done on any practical lines to develop the idea of conveyance of troops in war by speed vehicles on the road. One trial was made, at the instigation and by the organization of civilian enthusiasts, when a successful experiment was carried out in the conveyance of a body of troops from London to Brighton by motor car, and which taught some important lessons. But still there was that fatal sluggishness which so often besets the military mode of thought when proposals for any change are made, and which leads to failure for the time of development in the practical use of inventions. As is not uncommon, there was a tendency to brush aside proposals for change of system, and often by the aid of arguments, stated as unanswerable, before the matter had been carefully considered. Thus, "our military correspondent" of *The Times*, in commenting on the paper, disposed of the matter in *ex cathedra* style, by saying that "of course" the railroad furnished the best and most rapid means for conveying troops over all distances too great for marching. Again, the critic of the Brighton expedition condemned the autocar as inefficient because the delivery of the troops took such a long time, as each autocar discharging its load, and then getting out of the way of the next one, caused a great deal of time to be lost at the point of arrival before the troops could be ready to move.

Very little reflection would have shown to the first critic how

[1]Reprinted from *Journal of the Royal United Service Institution*, August, 1916.

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UNITED STATES ARMY AUTO-TRUCKS IN MEXICO.

fallacious his "of course" was. It is true that for long distances the railroad may be the most expeditious and efficient means of moving troops. But it may surely be reasonably argued that this does not necessarily apply to shorter distances—say, of 100 miles or under—and certainly does not apply to rapid emergency calls for troops at a particular spot, and their movement without warning to the enemy. In the first place, there must be a line of railway available; next, there must be an organization of rolling stock and engine power at the spot most convenient, trains must be marshalled, the line must be cleared, the troops entrained in bulk. Again, the expedition cannot, in all likelihood, be delivered at a railhead which is the most advantageous in the special circumstances. The spot where the troops are necessary may be many miles away from the station at which the transit by rail must end. Long marches in a lateral direction may be required, and thus much time be lost and exposure and risk to troops moving to a flank caused, and the troops may arrive too late, or may be exhausted. Again, the movement is practically sure to be known to the enemy, and he knows the line used as being the only railroad available. By his secret service he can learn what number of trains—and so what number of troops—are being brought forward, and can prepare to meet them to his own best advantage. He can also stop progress if he can raid the line, or throw shells on to it miles behind the appointed railhead, while the force cannot deviate, but must either come straight on or part with the means of carriage transit, and march, having, by the choice of a railway for conveyance, told the enemy exactly along what line on the map the force may be expected to come.

The other argument raised in reference to the Brighton expedition is a very marked illustration of the lack of imagination which sometimes besets the military mind: a lingering shred of the engrained system of the old days, when it was not part of the province of anyone junior to the General of Division to think, but the sole duty was to obey orders, and if orders did not reach him, to do nothing. "What business have you to think?" was a most common rebuke to the thoughtful soldier. Initiative to work things out in the spirit, as distinguished from the letter of his orders, was denied him. Today it is very different, but, too often, as has been truly said, "tradition lingers, and especially

in the Army." Surely nothing could be more devoid of imagination than to condemn movement of troops by autocar because the procedure at arrival was supposed to be necessarily the same as the delivery of ladies, carriage-by-carriage, at the Opera, or at a society rout. "Of course"—to seize the critic's expression—nothing could be more absurd than to propose to empty two or three hundred autocars of troops by bringing each to the same spot, causing all behind to dribble up, one by one, at a snail's pace. In the case of the Brighton expedition, to the success of which this was the sole adverse criticism, it might have occurred to those organizing it, and to the critic, seeing that the cars had to be emptied in a street, to stop the leading car at the entrance to the town, the next car running past it into position beyond, and so on, reversing the whole convoy, and thus delivering the whole at the utmost speed possible. If the body of troops were large, it would be unnecessary to reverse the whole. When a small number—say a dozen—had drawn up as above, the first six that came in could have been cleared out of the way, when empty, one by one, and be followed by the rest, and so the landing spot cleared for the next dozen. Thus the alighting would be done without any delay. And as regards dismounting the troops in open country in war, what could be more simple than that the Staff Officer directing the troops on arrival at their destination rendezvous should run them into a convenient grass field, the leading cars forming in line at the top of the field and the others taking up position in lines behind, a space at the side being left for the passage out. Thus the whole would be cleared as rapidly as the cars ran in.

These thoughtless objections being thus easily met, the advantages of road transit, now that this can be accomplished with speed, may be considered. First, let me say that it is an entirely erroneous idea that for distances up to, say, 100 miles, the train is a more rapid mode of conveyance than the road motor. The reverse is the fact. This may be illustrated by a simple case, the details of which are known. A friend, who lives at a considerable distance from London, was used to travel by rail, driving to the station, and again driving from the arrival station to his destination in town. When he purchased an autocar he drove from door to door by road. The speed was kept strictly

within the legal limit, viz., 20 miles an hour, and was, of course, considerably less when passing through towns or when the car was making its way through three miles of London streets. Notwithstanding, he found, on timing the one journey against the other, that he reached his destination in about a quarter of an hour less than when the railway was used. The gain was, of course, much greater on the occasions when the train was late. Had high speed been used in the open road—as would be the case in the transit of troops—the saving of time would have probably been twenty-five per cent or more as compared with the railway.

This gentleman's journeys by rail were made at the usual high speed, but it is certain that when a railway line is occupied with military transport, speed cannot be great. As already pointed out, in most cases considerable time must be occupied in bringing the necessary locomotive and rolling stock to the place required, and the entraining of a large body of troops implies that time must be expended between their quarters and the station and entraining them, possibly with meagre platform accommodation, which involves a good deal of shunting back and forward. And if there are guns or stores to be moved at the same time, the free use of the line for troops may be considerably hampered. Also, as already pointed out, it will very often be the case that the railroad, at which the troops leave the train, may be miles distant from their true destination, thus involving further loss of time, which may be fatal.

Let this be contrasted with what is possible if a service of autocars is available for the conveyance of the troops. The journey begins at speed at once. The cars start from the barracks or camp where the troops are at the time. They can be several miles out on the road before they could be marched to a station and entrained, even if they had every facility for doing so. Again, there would be in all probability several roads available, so that the force could be taken forward to different points as required, and could even be be deflected in one direction or another, as might be advisable from what became known of the movements of the enemy. A staff officer or a motor-cyclist with written orders, meeting a column at a fork of roads, might cause alteration of direction, and the power to do this—a thing impossible in most cases on a line of railway—might be of infinite value in bringing

special reinforcements to a spot where the action of the enemy might call for support to a particular part of the line.

Further, in the case of the autocar the eggs are in many baskets, while in trains they are in few, or in a single one. A railway breakdown at one point, stops the whole working of the line behind it. An enterprising patrol or a spy removing a rail or blocking the line with a stone, and so wrecking one train can stop the movement of thousands of men and dozens of trains following. A failure of an engine or the derailing of a train by accident may produce the same effect.

And, more than all, if the General Staff's dispositions are made in reliance on railroad transit only, the loss of the rail-line at any point is fatal to their plans, and may result in disaster. In short, the railroad is a very good friend and much to be prized, but it has its weaknesses, which it is part of an enemy's greatest efforts to accentuate. We see in the present war its value to our enemy, in the facility it affords for moving troops over very long distances from and to the different fronts of the enormous war area. On the other hand, we see how the carefully worked-out system of strategic railways, running parallel with the lines of attack, gives the enemy advantage, and how that advantage is lost in degree when by pushing forward into his opponent's territory he leaves these valuable aids in his rear. This is illustrated in the present war. The German railroad system within German country, being laid off strategically to give facility for moving troops laterally in any required direction, gives to the General Staff great advantages as long as the region of combat is near the German frontiers. But every ten miles he advances into his enemy's country he parts gradually with the advantages of convenience for flank movement and is accordingly liable to be checked in his speed and hampered in the freedom of his transport, becoming more and more dependent upon the roads. This has been well illustrated on the Eastern front of the war zone. Retreat by the Russians reduces the facility of operations by their enemies in a marked degree.

On the other hand, the possibilities of rapid road transit of troops have been demonstrated in the present war. It has been found to be "good business" to commandeer thousands of vehicles for use in conveying soldiery. Many a London omnibus, with its

advertisements of Cadbury, Sunlight Soap, and theatrical Revues, has been taken across to France, and Paris streets were cleared of its omnibuses, which were carried off to service with the Army. When the Germans were pushing their way up northwards to outflank the left of the Allies, and so make an opening for a march on Calais, a whole British brigade was taken up by the motor omnibuses and carried rapidly northwards, thus barring the way, so that for eight months the capture of Calais has been a word of false assertion or prophetic boasting, but has never been brought an inch nearer by advance of the attacking force.

The greatest demonstration of the value of the power-vehicle for troop transport was given when General Joffre, having resolved to turn at the Marne, made his great main forcing stroke by suddenly bringing to the front a large body of troops from the Paris garrison. The secret was well kept. On a certain night all the taxicabs in Paris were requisitioned to assemble at an early hour at various rendezvous. In the morning early the streets were filled with cabs, all moving rapidly, the drivers shaking their heads to the excited citizens, who, with their luggage on the pavements in eager desire to escape to Bordeaux, were hailing in vain every cab that passed. In a very few hours a great force reached the firing line, doubtless by several roads, bringing heartening to the hitherto retreating troops, and bringing aggressive strength to stem the tide and cause the German wave to recede over many a kilometre, over which it has never been able to return since. It was a brilliant French coup, and stamped the autocar once and for all as a most valuable aid to a staff organizing a rapid concentration of troops.

The Germans, too, have realized the value of motor transit and have used it on a large scale, and the Allies have now an enormous fleet of power vehicles, ready at a moment's notice to move large bodies of troops in any required direction.

The present war has given another remarkable demonstration of the efficiency of the power-vehicle in a very different phase of the contest, viz., in South Africa. When Maritz and De Wet had entered on a treasonable rebellion, the capture of De Wet, the highly skilled and experienced veldt leader, whose slimness was proverbial, became a primary object to General Botha, if the movement was to be promptly and effectively put down. A

Captain Saker, partner of a firm of autocar dealers, offered to pursue and take De Wet, who was out to incite the burghers to join his force. General Botha sanctioned the expedition and it set out. De Wet, with his horses in hard training, was able to keep in front for a short time, his pursuers having to face considerable difficulties, pushing through rough and loose sandy ground and charging scrub 3 or 4 feet high. But they soon wore out De Wet and his horses, and he surrendered, acknowledging, with admiration, what it was possible to do with the autocar. It may well be believed that if the motor vehicle had been available in the South African war, the Boers, even with their evasive ponies, might have been brought to surrender much sooner, and much more cheaply in blood and treasure than was the case. We used up many thousands of men, and more than a quarter of a million of horses, in vain attempts to catch up foes who, with excellent means of running away, were so often able "to fight another day" to our great loss.

As regards transport, who can doubt that the admirable manner in which our troops have been fed, both in sufficiency and regularity, is due in great measure to the facilities provided by a vehicle that can run at speed, that has no need for rest to feed, or indeed practically for rest at all? And when the care of the sick and wounded is considered, who can give any estimate of the many lives and limbs saved by efficient ambulance work, and how many less severely wounded men have been able to return quickly to the front by it being possible to convey them rapidly to the rear, where the best of treatment, both surgical and nursing, brings about speedy, and, where it is possible, complete recovery?

No excuse need be made for introducing here part of an account sent home from the Front by a Quartermaster in charge of nearly 40 motor ambulances, giving as it does a graphic illustration of the horrors which have to be faced in cold blood, after a severe engagement, and also of the highly efficient work of the motor ambulance in bringing the wounded to the rear. The first account relates to the fighting near Albert, in a comparatively early stage of the war, the second to a later period, after one of the terrible battles of last spring.

This is an account taken from the narrative—and condensed—of the first incident. The owner of a car had it converted into an

ambulance, and took a friend as a driver, who afterwards was promoted to Quartermaster. Immediately after their services were accepted they received an order to go to Albert, beyond which a fierce battle was going on. Three trips were made to the hospital in Albert, over a distance of 26 miles out and in. There were still some wounded in the temporary hospital there, and so in the evening a fourth journey was made. On approaching the town it was seen to be in flames. However, they resolved to go on to see if anything could be done. They found the hospital still standing, but its fate was sealed, as may be gathered from the fact that the owner of the ambulance, getting down and dashing into the hospital, called out to his driving friend to turn the car round and so get the car as a screen from the heat, and to hold on if possible. They found only four men. Two were got into the ambulance, but the other two could not be moved, as they were just at the point of death, and their two nurses refused, with signal devotion, to leave them, saying they would stay with them to the last. All the other wounded men, who could move, had hobbled off to escape from the fire, and about a mile out of the town they were found exhausted, sitting with their feet in the ditch on the side of the road. They were put into the ambulance which carried its load to the railhead, as the night closed in. This one car brought no less than 200 wounded from the Front in its first week of work, a thing which would have been impossible had only one horsed vehicle been available.

The other account of a night's work, I give in the Quartermaster's own words—a curious mixture of pathos and humour:—

"One afternoon we heard a tremendous banging and popping, and presently we got an urgent call for as many ambulances as we could spare. I got together six ambulances and a station bus, capable of carrying eight sitters, and set off at 7 p.m. It was pitch dark and raining hard, but a map, an electric torch, and the fighting line brilliantly illuminated by magnesium flare-rockets, kept us straight, and we found our way, *via* a network of bad roads, to the Poste de Secours. I was leading up the lane, and was told to turn sharp into a narrower one, which I did, with the result that my car fell into a shell hole, exactly at the corner, a funnel-shaped affair, about 4 feet wide, and how

deep I do not know, as it was full of liquid mud and quite invisible from the driving seat. Nothing happened to the car luckily, but I used language about the German gentleman who put his shot just there, because the lane was so narrow that if one missed the hole, one met the wall across the way. This meant reversing into a seething mass of horsecarts, hand ambulances, wounded men on stretchers, etc., all of which were arriving continually from further up the main line of road.

"Round the corner we came to a door in the wall, waded through it, across an unspeakable yard, into various barns and outbuildings, where wounded men lay and sat, literally in heaps. One stable lantern, hanging from a beam, only served to disguise the pitiable state of these poor fellows, caked all over with mud and chalk, boots were sodden lumps, shrapnel wounds, shell wounds, rifle and machine gun wounds—and worse than all to look at—bomb and hand grenade wounds and burns. It was a night of hand-to-hand fighting, where the hand grenade was making close acquaintance with many an unfortunate face.

"Loaded up, we had a hard struggle to get away through the crush. We deposited our wounded at various places, several of which we had to discover. This took time, as there were no 'natives' about these parts at night, and one's only friends are the map and the electric torch. Most of these outlying places were not expecting a visit and one lost a lot of time digging the staffs out of their beds in all corners of the villages, and then getting places arranged for in a hospital which was generally over-full already. But for these delays we could almost have doubled our tally, as you may be sure we made these cars hum going back empty.

"I forget how many trips we made, but just before dawn we had the satisfaction of picking up the last movable man in the shed, completing our load direct out of the horse ambulances into our cars out in the mud in the lane. 'That finishes it for the present.' Back once more to X with seven cars fully loaded. At the Church there we deposited our wounded; but before they could find room on the straw, which replaces seats in the body of the Church, others who were there already, and had had their dressing, had to be carried out and loaded into our cars.

"Broad daylight now, and everyone concerned beginning to

feel sleepy, so we were not sorry to know that we had only about eight miles to run to an evacuation hospital at a railway station, where they know their business. The loading finished, a rush to the nearest *estaminet* for the never failing coffee and rum, and then home seven miles, just in time for morning parade, at which we were *not* present. A huge breakfast, and so to bed, having carried 144 wounded in the night, bringing our total for the 24 hours up to 235. 'Good work! Give us more of it!' is what we all say."

Such a story gives a graphic picture of what this war is, both in its accumulated horrors, and the amelioration brought by the voluntary efforts of the army of non-combatants who devote themselves to the care of the wounded—the angels of mercy saving some out of the fangs of the Angel of Death.

One can imagine how these horrors would have been more than doubled had there been no other traction power available than the horse. Many a life and many a limb among these 235 would have been sacrificed from delay in bringing the wounded to a hospital where their wounds could be properly attended to, not to speak of the protracted and aggravated suffering.

All the motor services that have been spoken of hitherto may be called non-combatant services, although they at times are not exempt from injury to man and vehicle, in these days of long range weapons. But the motor vehicle is also to be found within the zone of fire, giving most valuable assistance in the actual combat. General and Staff Officers can give witness to the advantages of conveyance by power vehicles. They can be conveyed with three times the speed of the horse from one point of the battlefield to another, and that with less fatigue than is caused by riding. A notable instance of this occurred when General von Hindenburg was crippled by an attack of gout. With the aid of a motor car he was able to visit the whole of his command without having to alight even once. Orders are also conveyed over great distances of the firing line by motor-cyclists, often a most dangerous service, for which we read there are abundant volunteers.

But there are even more important services given by motor vehicles in the actual combat. It has been possible to organize movable forts, by armour-plated autocars, which carry one or

more machine guns and rifles, and these are found most effective in covering an advance, or a retreat, or assisting to maintain a body of troops, by raking the enemy on a flank. Such moving forts can be effective in many different ways, and no force can now do without their aid. The motor-bicycle with sidecar is also proving itself a highly useful aid in the field, a machine gun being carried behind a steel shield. Very bold raids can be made with such vehicles, which can use high speed both in advance and in retiring, and therefore can hold on longer at any point, aiding an advance or covering a withdrawal.

The power-vehicle is also in regular use for the conveyance of the heavy ordnance which are now employed in the field. The modern fight being essentially of a siege character, defence works having to be heavily bombarded before an assault can be delivered with any chance of success, the siege-gun must go forward or back, as the fighting troops advance or retire, and the power, by the aid of the petrol motor, to move heavy guns is of great value. Of course, the work of moving such guns is often made exceptionally difficult by the character of the ground, both as regards its natural formation and as regards the condition into which it is brought by foul weather. To overcome the difficulties, the power-vehicle supplies an efficient means. By the aid of large wheels, with a series of hinged discs round the rim, very powerful work can be done; and, by an ingenious device, a vehicle can be taken over soft ground or sandy soil, and can be moved over mounds and hillocks. The device consists in coupling together the back and front wheels—in this case of course of the same size—by a chain loop passing over both, the chain engaging in sprockets on the rims of the wheels. Thus the driving power is applied to both wheels, just as the power is applied to both wheels by the crank-rod of a locomotive engine. On the outside of the chain there are a succession of broad discs, which may be compared to feet, and which support the vehicle by their broad surfaces extending below the wheels and along the chain when it is between the wheels. Thus the pedrail, as it is called, prevents sinking in soft ground, and also the skidding of wheels, where ground is slippery. It also enables the traction power to be applied effectively, although ground is uneven, as the chain with its discs holds the ground, even though there is consider-

able unevenness. From the appearance of the vehicle with its chain upon the ground, it has been given the name of the Caterpillar. This device is proving to be of the highest value, taking the place, as it can do efficiently, of teams of twenty horses or oxen, moving its load at a considerably higher speed than could be attained by animal power upon the road, and taking the load over places where no animal team could be used.

Whether the limit of the adaptability of the power-vehicle for war has been reached, or whether there are greater developments to come, there can be no doubt that already its services have proved of immense value, and that no combatant could hold the field without it. It is now a necessary and efficient part of military equipment.

Business Men for Adequate National Defense.

General Military, Industrial and Financial Preparedness Favored

BUSINESS men want preparedness. They have voted for it in a referendum of the Chamber of Commerce of the United States. A majority of 120 to 1 was recorded. Those who have a definite stake in the country and must bear a large share of the burden of paying the bill for national defense have come out squarely for a comprehensive scheme involving the entire military, industrial and financial resources of the nation.

There has been propaganda of all kinds for preparedness and non-preparedness, including straw votes, newspaper campaigns, and the circulation of pamphlets and statistics. This, however, is thought to be the most thorough and complete effort yet made to ascertain country-wide sentiment on a question so prominently before the people and Congress.

According to the vote cast, it is now said to be known exactly where the business men of the country stand on the general question of preparedness and also what their views are for an adequate army, a largely increased navy, a thorough-going industrial preparedness, and the basis on which all these features must rest—universal military training.

Largest Vote in History of Organization

The referendum on national defense is of further interest because it has brought out the biggest vote ever recorded from the commercial organizations which make up the Chamber of Commerce of the United States. The heaviest voting was on the general preparedness recommendation and resulted in 970 in favor as against 8 opposed, a proportion of 120 to 1. The lowest vote was on universal military training, 889 in favor and 56 opposed; but even here the proportion was more than 15 to 1. Forty-three states were represented, the District of Columbia, Alaska, Hawaii, the Philippines and the American Chamber of Commerce in Paris, France.

Numerous plans have been advanced having to do with the

army and navy, but it is said that heretofore there has been no serious attempt to look on preparedness for national defense as a nation-wide problem which could only be solved by mobilizing the entire resources of the country, both actual and potential. The referendum was based upon the report of a Special Committee of which Bascom Little, recently president of the Cleveland Chamber of Commerce, is chairman.

Universal Military Training Advocated

The success of any general scheme of national defense, according to the referendum to which the Chamber of Commerce of the United States is now committed, can only be realized under a system of universal military training. Senator Chamberlain has a bill in Congress to provide for such a system, but it has not yet been introduced in the House.

It is the belief of the committee of the National Chamber that the duties of every citizen, great or small, must be definite and that there can be no military organization in a great democracy such as ours which would be either desirable or safe, much less adequate unless it laid down for all time the principle that equal rights mean equal obligations and that every citizen must not only be willing but also able and prepared to defend his country.

How the Vote Stood

The essential question presented to the business organizations of the country was to ratify or reject a general plan of national defense, but the referendum itself was divided into ten recommendations to facilitate balloting. The vote on the several questions which composed the comprehensive scheme, according to the preliminary count, was as follows:

	For	Against
1. For general preparedness	970	8
2. For a Council of National Defense	912	46
3. For a Staff of Industrial Mobilization	925	47
4. For an adequate navy	952	10
5. For a General Staff of the Navy	946	19
6. For a regular army with trained reserves such as recommended by the General Staff or Council of National Defense when established	946	21

7. For universal military training.....	889	56
8. For prearrangement with private companies for war supplies	940	26
9. For reserve supplies of war material.....	935	29
10. For additional commissioned and non-commissioned officers of the regular army and a properly trained officers reserve corps	960	9

No Specific War Contemplated

In justifying the necessity for general preparedness the report of the committee on which the referendum was based stated that it was as futile to ask for what particular war the United States is to prepare as to ask a ship captain against what particular accident or storms his ship carries life boats. Moreover, it is the belief that in any great scheme of national defense there can be no question of rich or poor, privilege or non-privilege. According to the committee there can only be organization on the basis of each citizen's capacity to serve either in arms or in the industrial mobilization. It was the opinion that national defense must be based on the realization of every individual that he has a vital stake in the life of the nation.

Cooperative Industrial Mobilization

With the above principle as the fundamental basis, the referendum sets forth a plan which calls first of all for the establishment of a body in the nature of a Council of National Defense which can perform an advisory and coordinating function in obtaining a comprehensive view and arrangement of the vast number of elements which must be comprised in the defense of a nation of 100,000,000 people. This council would thus also be able to develop the army and navy in accordance with a continuous policy under the orders and advice of the President and Congress.

As the Council of National Defense will obtain a comprehensive perspective of the needs and policies of the nation, so it is necessary to establish a Staff of Industrial Mobilization so organized and maintained in time of peace as to insure the most effective use of the economic resources of the United States in case of war.

This body would include functions which no amount of "last hour" legislation can afford in providing complete reserve munitions and equipment for both the navy and the army and organ-

izing a system to continue such supplies on an effective basis in time of war by a prearranged organization and training of all industrial and economic resources.

Industrial Preparedness

It might be expected that business men would lay emphasis on industrial preparedness. The Chamber of Commerce of the United States is now committed to what is claimed to be the only practicable system which can be devised in a democracy for mobilizing the industrial resources of the nation by a definite system of prearrangement for war supplies. Since war has become to a great extent a matter of equipment and munitions it is declared that the permanent efficiency of the army and navy must depend upon supplies.

The fundamental feature of the system advocated is to educate private industry in the manufacture of war material in time of peace under a mutually prearranged regulation of prices with private manufacturers rather than to trust to production in government plants alone.

This can be done, it is claimed, first by making a comprehensive industrial survey of the thirty thousand or more plants in the United States immediately available for the production of war material. After such a survey is complete, the plan provides that the government should enter into contracts with each of these firms for a small annual supply of the material for which they are particularly equipped. These orders in the aggregate should be sufficient not only to supply current needs of the army and navy, but also sufficient to accumulate a reserve of material adequate to supply our land and sea forces from the beginning of a possible war until such time as the industries of the country can produce the vastly increased supplies then necessary.

Nothing appears in the army bill passed by Congress which will allow for the establishment of a system of this kind until a time when, it is declared, it will be too late. It is not yet known what may be provided in this direction in the navy bill when it is finally passed.

Larger Army and Navy

The business men who voted on the referendum are committed to an army such as that recommended by the General Staff or

a Council of National Defense when established. This would mean a larger force than that provided in the army bill this year and will, it is said, constitute a standard which the Chamber of Commerce of the United States and its members will make an effort to have realized in subsequent legislation.

No Profit Interest in War

The referendum lays special emphasis on the fact that there should be no munitions trust or any possibility of arrangements which would make the real needs of the country subject to a profit interest in war on the part of anybody. The system of prearrangement for war supplies advocated will, it is claimed, remove all possibility of making capital out of the country's necessary plans for defense. It includes an industrial survey which will take in the thirty thousand or more plants which are qualified in one way or another to furnish war supplies and will embrace so wide a field that any combination of interests will be impossible. Furthermore, the prearranged agreements with manufacturers will be on a cost plus or other basis which, while doing justice to stockholders and owners, will be absolutely insufficient to create any interest in war.

Book Reviews.

Rifles and Ammunition and Rifle Shooting. By H. Ommundsen, G. M. and G. C., and Ernest H. Robinson. New York: Funk & Wagnalls Co., 1915. Royal 8vo, 333 pages, buckram, 7½ x 10. Price $6.00 net.

Part I of this book is essentially a history of the development of the British rifle and ammunition from the time of the match-lock, serpentine, wheel lock, and flint lock, through the various types of muskets and rifles to the Lee-Enfield used in the British Army today. The development of the rifles in Europe and America is touched upon lightly, but only as it influenced the development of the rifle in England.

The difficulties encountered by the early gunsmiths and ammunition manufacturers are discussed. A history of the development of the rifles and ammunition is naturally interwoven with the discovery of the laws of ballistics, and the authors show how earnest inventors and experimenters established principle after principle, and finally made the manufacture of rifles and ammunition a most exact science.

A chapter is given to a comparison of modern rifles and brief descriptions of the rifles of the leading military nations of the world. Some space is devoted to sporting rifles and ammunitions, and the .22 caliber rifle is treated at length, and its effect upon the development of rifle shooting in the British Empire is discussed.

Part II is devoted to practical rifle shooting in war, in the field, and on the range. There is very little new "shooting dope" in this part, and while there is a considerable amount of information for an inexperienced man, there are many other sources in which the information is stated much more clearly and concisely.

On the whole, any well informed officer of infantry or cavalry will learn very little of practical shooting from this volume that he does not already know, and if he is not in search of information concerning the historical development of the British rifle, there is not sufficient military value in the book to justify the expenditure of the time necessary to read it.

Military Topography and Photography. By Lieut. Floyd D. Carlock, U. S. Army. Menasha: The Collegiate Press, 1916. Cloth, 8vo, 310 pages, illustrated. Price $2.50.

The author has collected a great quantity of correlated topographical information from various sources and presents it in 300 very instructive and at the same time readable pages. It will prove a useful book to those engaged in military sketching or surveying.

Chapter I on Military Map Reading is clearly and concisely presented. Page 16, 4th line from bottom should read "dividing into 60 . . . ."

Chapters II and III on Topographical Surveying and Military Sketching are well treated and give a considerable amount of practical, concrete assistance to the sketcher. The system of producing a map of a territory, beginning with the primary triangulation and finishing with the completed map, is comprehensively discussed. Bessel's method of orientation, page 73, frequently gives an intersection off the board but is undoubtedly safer and more accurate than the mechanical orientation, which is also described in the succeeding pages of the text.

Chapter IV on Military Photography is very timely and, so far as tactics is concerned, incorporates the best thought of the day. Aerotopography is being tested and perfected in the present war and will be of even greater use in the future. Full details as to the camera and its operation are given and will assist in the grasp of the refinements of photography's latest field.

Chapter V on Special Problems is a convenient reference section giving instructions for the use of the various instruments employed in accurate survey work. The details of leveling and control traversing together with specimen field notes are presented in order. The mathematics of surveying are assembled under this chapter.

The Conventional Signs of the U. S. Army Maps are included, also five tables of necessary data. The index is unusually full and adapted to facilitating reference to any desired point. Numerous sketches, diagrams, and plates appear throughout the book.

My Fourteen Months at the Front. By William J. Robinson. Boston: Little, Brown and Company, 1916. Cloth, demy 8vo, 201 pages, illustrated. Price $1.00.

This is an account of the experiences of a young American boy of twenty-two, who more for the love of excitement than anything else, enlisted in an English cavalry regiment, but on account of his ability to drive a car and motorcycle became chauffeur and dispatch bearer. It is one of the most graphic accounts of the war that has been published. He modestly tells of his experiences from the time he joined the British Army in September, 1914, until he was discharged fourteen months later on account of illness. During that time he carried hundreds of despatches along the Allies' front, on motorcycles or on horseback, exposed to German shell fire. He drove motor cars for many prominent British officers. Speaking of the destruction of motor cars, he says that their average life is eight days, and that during his time at the front, he put six automobiles out of commission, one destroyed by shell fire in Ypres while he was at dinner, another he set afire and abandoned where it was stuck in a plowed field near the enemy. The author participated in both battles of Ypres, Hill 60, Neuve Chapelle, St. Julien, Potigi, Hooge, and Loos. The book appeals as a true account of actual experience, rather than the tale of a newspaper correspondent who was forced to obtain his local color by hearsay.

The Way They Have in the Army. By Thomas O'Toole. London: John Lane Company, 1916. Cloth, 12mo, 263 pages, with colored plate.

This book is a sort of popular encyclopedia of the customs of the British service, showing the organization of the army and the meaning of such elemental terms as company, battalion, regiment and brigade. To one not familiar with the fact, it is interesting to know that a British infantry battalion corresponds to our regiment, four such usually forming a brigade, while a regiment may consist of from two to seven battalions. Battalions are usually commanded by a lieutenant-colonel and are composed of four companies each commanded by a major or captain.

In classifying the various organizations, the author logically starts with the infantry division, consisting roughly of about

20,000 men. The cavalry regiment, however, is a recognized unit, though much smaller than our own and consists of about 550 of all ranks; three regiments form a brigade, the numbers contrasting somewhat startlingly with our own cavalry brigade.

The author gives the regimental nicknames of most of the more famous organizations with the legends as to their origin, enumerates the various ranks from Private Thomas Atkins, C. B. ("Confinement to Barracks"), to Field Marshal, and otherwise summarizes "the way of the army."

Roadside Glimpses of the Great War. By Arthur Sweetser. New York: The Macmillan Company, 1916. Cloth, demy 8vo, 272 pages, illustrated. Price $1.25.

This book delineates the experiences of an American newspaper correspondent in the early days of the war. Paris being too far from the front, he started for Lille near the Belgian border, and here it was that he acquired the second-hand bicycle that was to take him in the wake of Von Kluck down to the Marne, a prisoner of the Germans, only to leave his captors at Verberie and to fall into the hands of the French and again become a prisoner. A day or so for explanations, and he is again free in Paris. Not satisfied he again attempts to reach the scene of active operations, is again made captive and handcuffed to a German prisoner, but with the most astonishing good luck is released, visits Antwerp as the honored guest of the American Consul in Ghent a few hours before its fall, back to Ghent, to Calais, and finally to Ostend and Folkestone, footsore and weary.

This is one of the dozens of books recently published that give some slight idea of war in its elemental human terms.

A Manual of Intensive Training. By Lieut. Elvid Hunt, 1st Infantry. Honolulu: Hawaiian Gazette Co., Ltd., 1916. Paper, 16mo, 48 pages. Price 25 cents.

This is a program to be followed in systematically training a detachment of infantry for field service, carrying it through the numerous subjects in which a foot soldier should be proficient if he is to be efficient. The pamphlet is essentially an outline

Some day you'll hit on a Sensible cigarette

And as soon as you smoke it, you'll at once *know* that it's sensible:

(1) It will please your taste. That goes without saying, otherwise it would not be sensible for you.

(2) It will be comfortable to your throat and tongue—not hot or bity as some cigarettes are.

(3) And it will not leave you feeling "over-smoked" even after a long-smoking day.

We would like to have you match Fatima against each one of those three points for a sensible cigarette. *Then try any other cigarette made on those same points.*

So many other men have found Fatimas the most sensible cigarette for them that Fatimas now outsell every other cigarette costing over 5c.

Doesn't it seem reasonable that you will like Fatimas best too?

Liggett & Myers Tobacco Co.

for the purposes mentioned and is not intended to replace text books on the various subjects forming the course. While the scheme proposed is applicable to any company, it is especially suited to the uses of the commander of a recruit detachment or the captain of a volunteer company. Virtually everything the infantry soldier is supposed to know is covered by the outline, in a general way, in the order in which it is to be taken up. Valuable suggestions are made relative to the supervision of instructors and the training of noncommissioned officers.

The Aftermath of Battle: With the Red Cross in France. By Edward D. Toland. Preface by Owen Wister. New York: The Macmillan Company, 1916. Cloth, demy 8vo, 175 pages, illustrated. Price $1.00.

Owen Wister in his introduction to this book pays high tribute to the author's unaffected style:

As page succeeds page written without art, yet with the effect of high art, with the effect (for example) of De Foe's account of the Plague, the reader ceases to be looking at a picture, he is himself in the picture, its terrific realities surround him as if he were walking among them.

Frankly it must be said that the book is too realistic. It is not nice reading. There is too much of the gruesome, of the septic side of the poor wounded and maimed derelicts left by the ebbing tide of battle. The realities are too grim for lay expression or to be set down outside of a medical report—and would find no place there, as they would be so well understood by professional men as not to require delineation.

Criticisms Upon Solutions of Map Problems. Compiled by Captain Charles T. Boyd, U. S. Cavalry. Menasha: George Banta Publishing Company, 1915. Cloth, 8vo, 284 pages. Price $2.00.

This volume presents a series of map problems solved by the Line class under several different instructors, the problem commands varying in strength from an officer's patrol to a brigade, and altogether involving all arms. Each is followed by notes of errors in student's solutions with criticisms thereon by the instructor, and finally by an approved solution. Maps are not furnished with the book but the following sheets of the Gettysburg 3-inch map are necessary in studying the problems: Gettysburg, Hunterstown, New Oxford and Bonneauville.

The First Hundred Thousand. By Ian Hay. Boston: Houghton Mifflin Company, 1916. Cloth, 8vo, 342 pages. Price $1.50.

A really worth while book. This story of "K(1)" was originally contributed in the form of an anonymous narrative to *Blackwood's Magazine* and some of the chapters will be familiar through having been reprinted in this country. The author disclaims any sanction as an official historian of the war, the chapters having been written from day to day merely as a record of some of the personal adventures of a typical regiment in Kitchener's first army.

The book is full of humor, with bits of character drawing that give one a personal interest in the men described. It is one of the few really entertaining books of the many that have been

written on the war. But through the maze of humor and pathos runs a trail of realism that contains a grim lesson for us in the necessity for adequate preparation and training for the ordeal that may some day face this country. It was not difficult to get men in the early days of the war, they came from the shop, the office, the counting-house and the mines. Then began the long, weary months of training under the none too gentle tutelage of the typical British (frequently Irish) drill-sergeant. For the most part, officers and men were on an equal footing so far as knowledge of the rudiment of discipline was concerned. All had to learn their lessons from the beginning.

The second part of the book is devoted to life in the trenches, the specialized style of warfare evolved by the present conflict, but the author describes the results of the training and the weeks and days of grinding routine before they took the channel boat:

What is he like, this impromptu Tommy Atkins? Well when he joined, his outstanding feature was a sort of surly independence, the surliness being largely based upon the fear of losing his independence. He has got over that now. He is no longer morbidly sensitive about his rights as a free and independent citizen and the backbone of the British electorate. He has bigger things to think of. He no longer regards sergeants as upstart slave-drivers—frequently he is a sergeant himself—nor officers as grinding capitalists . . . He is beginning to merge himself in the regiment. . . . So we pin our faith to the man who has been at once our despair and our joy since the month of August. He has character; he has grit, and now he is getting discipline as well, he is going to be an everlasting credit to the cause which roused his manhood and the land which gave him birth."

Read the book, become acquainted with Lieut. Bobby Little, Privates Mucklewame, M'Leary, M'Micking and other of "K(1)." You will not regret it.

Books Received.

An Army Woman in the Philippines. By Caroline B. Shunk. Kansas City: Franklin Hudson Publishing Company, 1914. Cloth, 12mo, 183 pages, illustrated. Price, $1.25.

Company Training. By Captain Cromwell Stacey, U. S. Infantry. Kansas City: Franklin Hudson Publishing Company, 1916. Cloth, 5x7", 173 pages. Price $1.

Coast Artillery Matériel. By Captain W. P. Platt, Coast Artillery Corps. Kansas City: Franklin Hudson Publishing Company, 1916. Cloth, 5x7", 170 pages. Price 60 cents.

Attack and Defense of Fortified Harbors. By Captain Arthur P. S. Hyde, Coast Artillery Corps. Kansas City: Franklin Hudson Publishing Company, 1916. Cloth, 5x7", 82 pages. Price 75 cents.

The Spirit of France. By Owen Johnson. Boston: Little, Brown & Co., 1916. Cloth, demy 8vo, 256 pages, illustrated. Price $1.35.

Germany in Defeat. By Count Charles de Souza and Major Haldane Macfall. New York: E. P. Dutton & Co., 1915. Cloth, 12mo, 207 pages. Price $2.

War Pictures Behind the Lines. By Ian Malcolm, M.P. New York: E. P. Dutton & Co., 1915. Cloth, demy 8vo, 226 pages, illustrated. Price $2.

Notes on Elementary Field Training. By "Grenadier." London: Hugh Rees, Ltd., 1916. Cloth, 7x4¾ inches, notebook form with blanks for comment.

Fundamentals of Military Service. By Captain Lincoln C. Andrews, U. S. Cavalry. Philadelphia: J. B. Lippincott Company, 1916. Limp leather, 12mo, 428 pages. Price $1.50.

THE UNITED STATES INFANTRY ASSOCIATION

"The object of the Association shall be to promote the efficiency of the Infantry arm of the military service of our country by maintaining its best standards and traditions, by fostering esprit de corps, by the dissemination of professional knowledge, and by the exchange of ideas as to the utilization of such knowledge with particular reference to the rôle of infantry in modern war."—Article III of the Constitution.

OFFICERS.

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Colonel Edwin F. Glenn, Infantry.

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CONDITIONS OF MEMBERSHIP.

All commissioned officers in good standing, or former commissioned officers of honorable record of the regular or volunteer military or naval service and of the organized militia are eligible for regular or associate membership in the Association. Membership dates from the first day of January or July nearest the date of enrollment.

Dues are $1.00 annually, payable in advance. Payment of dues entitles a member to all the privileges of his class and to all ordinary publications of the Association except the INFANTRY JOURNAL, to which subscription is extra. Members, however, may obtain the JOURNAL for $2.00 the first year, and $1.00 yearly thereafter.

All communications should be addressed to the Secretary, United States Infantry Association, Room 506, Union Trust Building, Washington, D. C.

The Infantry Prize Essay, 1916.

The conditions governing the competition for the Infantry prize to be awarded for the best essay on the subject "Method of Training Troops so as to graduate trained men into the Army Reserve after Two Years' Service with the Colors" were published in the November, 1915, issue of the INFANTRY JOURNAL. Nine essays were submitted in competition for the prize under the following *noms de plume:* "Luke D. Ingam," "Enalwa," "R. Bor," "Datu," "A Dreamer," "V. K," "Gat Red," "Peditatus," "Real Efficiency."

The Committee selected to make the award submitted the following report:

Washington, D. C.,
May 12, 1916.

THE EDITOR,
Infantry Journal.

SIR:

The undersigned committee appointed to select the best papers submitted under the conditions laid down by the Infantry Association for the annual prize essay, recommend that the papers submitted by "Enalwa" and "Luke D. Ingam" be given "Honorable Mention" and published in the INFANTRY JOURNAL.

In studying the papers submitted, the committee was impressed with the fact that the maximum limit of 8,000 words placed on these essays was insufficient to enable authors properly to develop and discuss a subject so important as that selected for this year's contest. For this reason, your committee have not felt justified in recommending any paper for the first or second prize and suggest that the length of the essay be extended in announcing the subject for the coming year.

E. SIGERFOOS,
Major, 7th Infantry.
J. McA. PALMER,
Major, 24th Infantry, General Staff.
I. L. HUNT,
Major, Bureau Insular Affairs, (Captain Infantry.)

The authors writing under the *noms de plume* referred to in the report of the Committee are:

"Enalwa": 1st Lieut. A. W. Lane, 13th Infantry;

"Luke D. Ingam": 1st Lieut. James L. Frink, 3d Infantry.

The essay written by Lieut. Lane is published on page 1091 of this issue of the INFANTRY JOURNAL.

Φ

The Infantry Prize Essay, 1917

FIRST PRIZE

One Hundred Dollars in Cash and Life Membership in the Infantry Association.

SECOND PRIZE

Fifty Dollars in Cash.

SUBJECT

The subject will be optional with the writer but must be one of vital interest to the Infantry arm of the service. The importance and timeliness of the subject will be one of the factors considered in making the award.

RULES

1. The competition shall be open to regular members of the U. S. Infantry Association. These according to the constitution are:

a. Officers of Infantry, active or retired, of the Regular Army, the Porto Rico Regiment, and the Philippine Scouts: officers of the Staff Corps appointed from the Infantry.

b. General officers of the Regular Army.

c. Former commissioned officers of Infantry, Regular or Volunteer.

2. The length of the essay is limited to 12,000 words. The manuscript must be typewritten, double-spaced, and in duplicate. When a member in submitting his essay states that it has been impracticable for him to comply with this requirement, a manuscript in longhand and in single copy will receive due consideration.

3. Manuscripts must be received in the office of the INFANTRY JOURNAL on or before March 1, 1917. The manuscripts must be signed with a *nom de plume,* and the name and address of the writer enclosed with the manuscript in a separate sealed

envelope, the outside of the envelope bearing the same *nom de plume* as the manuscript.

4. Immediately after March 1, a committee will be appointed to decide upon the relative merits of the essays submitted. The author of the essay considered worthy of the first prize will be paid $100 in cash and enrolled as a life member in the Infantry Association; the author of the essay deemed worthy of the second prize will receive $50 in cash. Should none be deemed worthy of first or second prize, the committee may, in its discretion give the best one submitted "honorable mention."

5. All manuscripts submitted will become the property of the U. S. Infantry Association, which reserves the right to publish them in the INFANTRY JOURNAL, or dispose of them in any other manner it sees fit.

6. Members shall be debarred from competing after having won the first prize twice.

NEW MEMBERS.

Harris, Jr., William W., 1st Lieutenant, Infantry.
Riley, Hugh R., Major, Maryland National Guard.
Savelle, Myles D., Captain, Alabama National Guard.
Currier, William P., 1st Lieutenant, Coast Artillery Corps.

Infantry Journal Advertiser

GENTLE HINTS, No. 23

WASHINGTON, D. C., May 1, 1916.

1. In the following pages, the buyers' directory, you will find the names of some sixty-odd representative concerns.

2. Some are wholesalers; others sell at retail; some have goods to offer, others only service. Some expect to and do sell goods to individuals. Others merely wish to keep their names and addresses before you for future business.

3. Whatever their immediate purpose each and all are worthy of your confidence or their names would not be in this select directory.

4. We guarantee the integrity of every firm or individual whose name appears here and that they will live up to their agreements.

5. When you are in need of any article, of whatever kind or nature, look first to see if one of our advertisers does not offer to supply it.

6. This is cooperation, and is the Infantry way—one for all and all for each.